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April 6, 2020

**ELECTRONIC MAIL & U.S. MAIL**

Melanie Bachman  
Executive Director/Staff Attorney  
Connecticut Siting Council  
10 Franklin Square  
New Britain, CT 06051

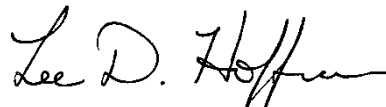
**Re: Petition 1347A - GRE GACRUX LLC Petition for a Declaratory Ruling, Pursuant to Connecticut General Statutes §4-176 and §16-50k, for the Proposed Construction, Maintenance and Operation of a 16.78 MW AC Solar Photovoltaic Electric Generating Facility Located at 117 Oil Mill Road and Associated Electrical Interconnection to Eversource Energy's Existing Substation at 325 Waterford Parkway North in Waterford, Connecticut. Reopening of this Petition Based on Changed Conditions Pursuant to Connecticut General Statutes §4-181a(b).**

Dear Ms. Bachman:

I am writing on behalf of my client, GRE GACRUX LLC ("GRE"), in connection with the above-referenced Petition. With this Letter, I am enclosing an original and 15 copies of GRE's Responses to the Connecticut Siting Council's March 3, 2020 (Set One) Interrogatories.

Should you have any questions concerning this submittal, please contact me at your convenience. I certify that copies of this submittal have been made to all parties on the Petition's Service List as of this date.

Sincerely,



Lee D. Hoffman

Enclosures

**STATE OF CONNECTICUT  
CONNECTICUT SITING COUNCIL**

**Petition of GRE GACRUX LLC for a Declaratory Ruling pursuant to C.G.S. §4-176 and § 16-50k, for the proposed construction, maintenance and operation of a 16.78 MW AC ground-mounted solar photovoltaic electric generating facility located at 117 Oil Mill Road and associated electrical interconnection to Eversource Energy's existing substation at 325 Waterford Parkway North in Waterford, Connecticut**

**Petition No. 1347A**

**April 6, 2020**

**GRE GACRUX LLC'S RESPONSES TO THE CONNECTICUT  
SITING COUNCIL'S FIRST SET OF INTERROGATORIES**

1. What is the expected capacity factor, on an AC MWh/AC MWh basis, of the project for the first year of operation? What is the average capacity factor over the 35-year life of the project?

The anticipated capacity factor for the project during the first year of operation is anticipated to be 22%. The average capacity factor over the 35-year life of the project is anticipated to be 20%.

2. Has the PURA approved Project PPA been modified to account for changes in Project output?

GRE GACRUX LLC ("Greenskies") objects to this interrogatory as it seeks information that is beyond the scope of the Petition. Subject to the foregoing objection, Greenskies states that although the project's output has changed somewhat, increased site efficiencies have allowed the project to retain most of its capacity while diminishing the number of acres needed to achieve that capacity. The project output shortfall is within the acceptable limits of the PURA-approved project PPA, and therefore, the PPA does not need modification if the project, as currently designed, is approved.

3. Petition pp. 8-9 describes an initial cleanup of the site. Does GRE intend to only clean the 45 acres within the project area or will the cleanup include the additional 21 acres that were logged, but outside the Project limits?

In response to the Town of Waterford's request, Greenskies only intends to clean up the 45 acres within the project area. Greenskies was informed by the Town that leaving the additional 21 acres in their current state will allow for greater habitat and biodiversity. While Greenskies has no objection to cleaning this portion of the site, Greenskies intends to honor the Town's request, absent instructions to the contrary.

4. Petition p. 10 states a wood chip berm will be created around the Project limits. At what point will the wood chip berm be removed? Where will the wood chips be disposed of?

Because the wood chip berm will be comprised of entirely natural materials, it is not anticipated that the berm will be removed at all. Rather, the berm will be allowed to naturally degrade over time.

5. Referring to Petition pp. 10-11, has enough soil testing been conducted to determine likely areas of post-mount and ballast mount panel arrays? If so, depict expected areas of each type of installation. What method is more costly to install?

Approximately 100 soil pit investigations have been performed on the site to date which has developed a fairly comprehensive understanding of subsurface soil profiles. It is currently anticipated that a post-mounted system (piles or ground screws) will be used in all portions of the project. Ground screws in particular work in a variety of soil profiles including shallow rock. In the unlikely event that concrete ballast foundations are needed, the Petitioner will make the Council aware and will address the hydrologic impacts of using a surface ballast system. It is typically more expensive to install concrete ballast foundations rather than pile or ground screw systems.

6. If concrete ballasts are to be used, would the ballasts be constructed on or off site? If on-site identify the location.

Based on the geotechnical work that has been done to date, as well as the redesign of the project, there is no current plan to use any concrete ballasts for the solar project. If concrete ballasts were to be used, they could be constructed on-site or delivered from an off-site location. Either method is acceptable to Greenskies.

7. How long are the panel racking posts? What is the desired post installation depth?

The final design of the racking posts and their installation depth has not been fully designed. Typically, however, the panel racking posts are installed to a depth of six to twelve feet. The remainder of the posts extend approximately five feet above grade in order to affix racking systems.

8. Referring to Petition p. 13, a Project area of 75 acres is given. Specify the approximate acreage of grubbing and non-grubbing.

Relating to the approximate 75 acres of tree clearing necessary to construct the project, it is proposed that approximately 65 acres shall be grubbed. The remaining 10 acres are proposed to have the stumps left in place. A plan entitled Stump Grubbing Map has been prepared portraying the proposed distinction between grub and no-grub areas of the Project for clarity. It is included as Exhibit A.

9. Referring to Petition p. 13, a low maintenance ground cover is described for the solar array area. What is the specific seed mix that will be used? Can the seed mix be established with

robust growth where shaded by the solar panels? Has this mix been used at other solar sites in Connecticut? If so, identify locations.

The proposed seed mix that will be used at the project has been specifically developed for use in solar projects in New England. The mix includes Sheep Fescue, Little Bluestem Camper, Broomsedge, Annual Ryegrass, lanceleav coreopis, plains coreopsis, black eyed Susan, common yarrow and butterfly milkweed. The mix is designed to be both sun and shade tolerant, with different species predominating in the shaded areas. Greenskies is not aware if this particular seed mix has been used elsewhere in Connecticut.

10. Referring to Petition p. 14, it states areas between the perimeter fence and cleared edge will receive a mix of native low-lying plants, shrubs and groundcover. What specific plantings and seed mixes does GRE intend to install?

This mix is not yet fully finalized, pending review from several outside sources. Greenskies is communicating with the CT Department of Agriculture, American Solar Grazing Association, UMASS Clean Energy Extension, and David L. Wagner, who is a Professor of Ecology and Evolutionary Biology at the University of Connecticut, to develop the best vegetation and management practices for the site. This will allow the project to maximize the value of the land beneath our solar arrays to prevent erosion, support wildlife habitat and allow for safe operation of the system. At this time the potential list of plantings includes: Big Bluestem, Little Bluestem, Switchgrass, Fox sedge, Silky Wild Rye, Common Milkweed, Deertongue, Pennsylvania Smartweed, Partridge Pea, Silky Smooth Aster, Nodding Bur-marigold, Flat Top aster, Perennial Ryegrass, Meadow Fescue, Red Clover, Anise-Scented Goldenrod, Black Eyed Susan, Common Yarrow, Calico Aster, Late Lowbush Blueberry, Narrow-Leaf Mountain-Mint, and Virginia Strawberry.

11. The construction hours on Petition p. 15 do not match the hours in the Petition Appendix C, please clarify. Are the construction hours for both the 2020 and 2021 work periods?

The construction hours on page 15 of the Petition should control. The project, however, does not anticipate that there will be construction activities beyond 7:00 p.m. on any given day. The additional two hours were placed in the Petition to allow for daily site cleanup and other ancillary activities. These are the anticipated construction hours for both the 2020 and 2021 work periods.

12. The MW AC output rating on Petition p. 22 and p. 5 of the Pre-file testimony of Jean-Paul La Marche do not match, please clarify.

The correct AC capacity for the project is 16 MW. However, Greenskies has not yet received final interconnection approval from Eversource. Therefore, that number is subject to a slight change, depending on the outcome of the interconnection process.

13. Petition p. 22, mentions a field walk with CT DEEP Stormwater Division. Who attended the field walk? What was the result of the field walk?

A site walk around the entire perimeter of the site was performed on January 27, 2020. The walk was attended by Neal Williams and Chris Stone of CTDEEP, Gina Wolfman and Ryan Linares of Greenskies Clean Energy, Lee Hoffman of Pullman & Comley, and Steve Kochis and Jared Whittier of VHB. An e-mail was sent from Neal Williams to Steve Kochis on February 26, 2020 with minor comments on the site plan, which will be incorporated into the CTDEEP Stormwater General Permit application of the project. A copy of that e-mail is attached as Exhibit B.

14. Petition Figure 10 shows the limit of work extending along the north property line, north-northwest of the mapped wetland area. What work will occur in this area?

No work is currently proposed in the area in question. The Figure 10 was prepared as part of the comprehensive wildlife report during the summer of 2020 and the limits of work were pulled back following the preparation of the report. Please refer to Figure 3A for the current limits of work and a depiction of how the project has been pulled back from 98 acres to 75 acres of disturbance.

15. What is the estimated percentage of pre and post devolvment within the Vernal Pool Envelopes and Critical Terrestrial Habitat areas for the on-site vernal pools?

The Vernal Pool Envelope is any area within 100 feet of a vernal pool edge while the Critical Terrestrial Habitat is any area between 100 feet and 750 feet from a vernal pool edge. Accounting for the recent timber harvest in the pre- and post-development areas of the vernal pools, the list of estimated percentages of development within the areas are as follows:

**Vernal Pool 1 (north of entrance road)**

- Vernal Pool Envelope:
  - Pre-Development: 8.9%
  - Post-Development: 8.9%
- Critical Terrestrial Habitat:
  - Pre-Development: 37.9%
  - Post-Development: 37.9%

**Vernal Pool 2 (south of entrance road)**

- Vernal Pool Envelope:
  - Pre-Development: 18.5%
  - Post-Development: 18.5%
- Critical Terrestrial Habitat:
  - Pre-Development: 35.2%
  - Post-Development: 35.2%

**Vernal Pool 3 (near existing wetland crossing)**

- Vernal Pool Envelope:
  - Pre-Development: 28.5%
  - Post-Development: 28.5%
- Critical Terrestrial Habitat:

- Pre-Development: 57.4%
- Post-Development: 57.8%

16. Has the logging road wetland crossing adjacent to VP-3 been evaluated for Project suitability? What modifications are necessary to accommodate construction vehicles?

Should the Council so desire, Greenskies is willing to revise the site plans to restrict access across the logging road wetland crossing adjacent to VP-3 and will propose instead that the primary access across the utility right-of-way from Oil Mill Road past the currently-proposed switchgear and Stormwater Basin 1 will be utilized. It is intended to continue a proposed road from the proposed cul-de-sac near Stormwater Basin 1 to the east to connect with the remainder of the Project. Also as part of this work, Greenskies would plant the logging road wetlands crossing with native low-lying shrubs as part of the abandonment. A revised site plan and planting plan for that area can be provided to the Council at a later date, should the Council wish to evaluate this option further.

17. Petition Figure 3A is not legible. Please provide a larger scale legible version.

A revised copy of Figure 3A has been prepared and is enclosed herewith as Exhibit C for reference. The title block has been made larger and more legible as requested.

18. Referring to Petition Site Plan C-3.0, what is the setback buffer shown along the east property line? Why is this setback buffer wider than the buffer along other property lines?

The proposed buffer between limit of work and eastern property line varies between approximately 100 feet at the closest and 500 feet at the most. The buffer to this property line is generally the widest in the Project due to the steep existing rock face along this property edge. The Project has been pulled back from this property line in the redesign effort as well.

19. Referring to Site Plan C-3.3, a note specifies that the stumps remain in the area between panel array and limit of work. What is considered the edge of the panel array? For swales outside the panel array area, what is the width of grubbing required for installation?

It is intended for stumps to remain to the maximum extents practicable outside the chain link security fence. Rather than address a specific grubbing width required for swale installations, a map entitled Stump Grubbing Areas has been prepared portraying the proposed distinction between grub and no-grub areas of the Project for clarity. As mentioned previously, that map has been included as Exhibit A.

20. Referring to Petition Site Plan C-5.0, Construction Sequence 2021 Note 1, why is mass earthwork being conducted after the site is initially stabilized rather than being completed when grubbing occurs during Construction Sequence 2020?

Mass earthwork is proposed for the spring/summer of 2021 largely due to lengthy anticipated time needed for timber harvest cleanup of the Site and the limited amount of construction time anticipated in the calendar year of 2020 following receipt of all necessary construction permits.

If timing permits during the calendar year of 2020, the Petitioner will attempt to perform the required project earthwork and stabilize it prior to winter shutdown.

21. Estimate the amounts of cut and fill in cubic yards for Project construction. Where would excess material be disposed of?

It is proposed to regrade approximately 13 acres of the Site. The total cut proposed is approximate 25,300 cubic yards and the total fill proposed is approximately 13,900 cubic yards. The net earthwork is that approximately 11,400 cubic yards of material shall be removed from the Site.

22. Referring to Petition Site Plan C-5.5, straw wattle is specified above sediment trap 16 but not above other Project sediment traps. Please explain.

The straw wattle is proposed at Basin 16 due to the wide amount of sheet flow that is anticipated to enter the top of the basin. Compost filter sock is proposed for other locations where stormwater runoff naturally becomes more channelized prior to entering a basin.

23. Referring to Petition Site Plan C-6.2;

- a. do the 3:1 diversion swale side slopes conform to the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control?
- b. why are 7 of the detention basins referred to as "ponds"? Are they designed with lower infiltration rates than the other 9 detention basins?

The proposed 3:1 side slope of the diversion swales conform to Section 7 of the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control. The design of each stormwater basin – pond, sand filter, or infiltration basin – was based upon the findings of the geotechnical investigations. The basins proposed to be ponds are measures where evidence of seasonally high groundwater was discovered in the geotechnical investigations. For these basins, no credit was taken in the hydrologic modelling and a starting water surface elevation at the expected seasonal high groundwater level was assumed to be conservative. For the basins designed as infiltration basins, one-half of the lowest of the tested infiltrated rates was assumed in the hydrologic model, in accordance with the guidance of Section 11-P3 of the 2004 Connecticut Stormwater Quality Manual.

24. What is the total length and total area of post-construction gravel roads?

The total length and total area of post-construction gravel roads on the Site, respectively, are proposed to be approximately 13,500 linear feet (2.6 miles) and 204,700 square feet (4.7 acres).

25. Petition p. 12 states the Project was designed in compliance with the latest iteration of CT DEEP General Permit Solar Appendix I. Please provide a copy of Solar Appendix I.

A copy of Solar Appendix I is attached hereto as Exhibit D.

26. Referring to the Petition Stormwater Report (Appendix B), what Project elements/features were considered pervious and impervious surfaces in the stormwater calculations to design post construction stormwater controls?

New gravel roads inside the Project footprint were considered to be impervious for the purposes of calculating the required Water Quality Volume (WQV) of the Project. The WQV from these improvements were computed in the Stormwater Report using the standard guidance from the 2004 Connecticut Stormwater Quality Manual. The solar panels themselves were not considered to be impervious with respect to CTDEEP Draft Solar Appendix I; however, the WQV for the solar panel array was computed using the Solar Panel Calculator from the Minnesota Public Drainage Manual to be conservative. Regarding the hydrologic pre- and post-development peak flow attenuation model, new gravel roads were assumed to be impervious while the remaining areas of the Project were assumed to be pervious.

27. Does DEEP Appendix I consider gravel roads as impervious cover? What Curve Number is assigned to impervious surfaces for stormwater calculations?

The Connecticut Department of Energy & Environmental Protection (CTDEEP) publication Draft Solar Appendix I does not speak to whether gravel roads should be considered to be impervious cover. However, Section 7.4.1 of CTDEEP's publication 2004 Connecticut Stormwater Quality Manual does state that gravel roads should be considered to be impervious cover for the sake of computing required Water Quality Volumes. Gravel roads in the hydrologic modelling program HydroCAD 10.00-22 are estimated to have a Curve Number of 96. Typically, "impervious surfaces" such as buildings and paved roads are given a Curve Number of 98; however, it should be noted that a gravel road would be expected to produce less stormwater runoff than a truly impervious surface and, accordingly, would have a slightly lower Curve Number.

28. Were post-construction slopes factored into the stormwater design using the slope criteria in Solar Appendix I? In what areas will different stormwater controls be necessary to comply with Solar Appendix I? Submit a diagram showing post-construction slopes using thresholds described in Solar Appendix I.

Post-construction slopes were considered in the overall site plan and stormwater design. Rather than only using hydroseed with tackifier on slopes greater than 8%, it is proposed to use hydroseed with tackifier at multiple intervals throughout construction to assist in the stabilization of the entire project area. It has also been incorporated into the construction sequence that the entire project area will be cleaned from the recent timber harvest and erosion controls will be installed and allowed to vegetate through a growing season before the development aspects of the project are implemented. The project as a whole has been pulled back from some of the steeper areas along the property lines to help minimize the amount of work on steep slopes, and it is proposed to regrade existing slopes exceeding 15% within the project limits to be under that threshold to the extents practicable. Lastly, it is proposed that stormwater runoff from all development areas will be captured by a system of excavated sediment traps, basins, and engineered swales. A diagram of post-construction slopes using the thresholds described in Solar Appendix I is enclosed herewith as requested as Exhibit E.

29. The hard copy version of the Petition Appendix A contains a PV Site Plan series that was not submitted in .pdf format. Provide a .pdf version of the PV Plan series.

A .pdf version of the PV Plan series is included herein as Exhibit F.

30. Has DEEP responded to the Project NDDDB survey report, dated October 2, 2019? If so, please provide.

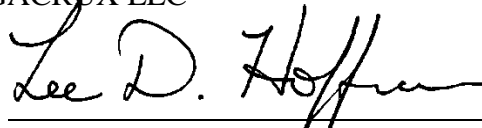
Yes. DEEP's response to the Project NDDDB survey report, NDDDB Determination Number 201914884 and dated February 28, 2020, is attached hereto as Exhibit G.

31. The hard copy and .pdf versions of Petition Figure 5 do not match. Please clarify.

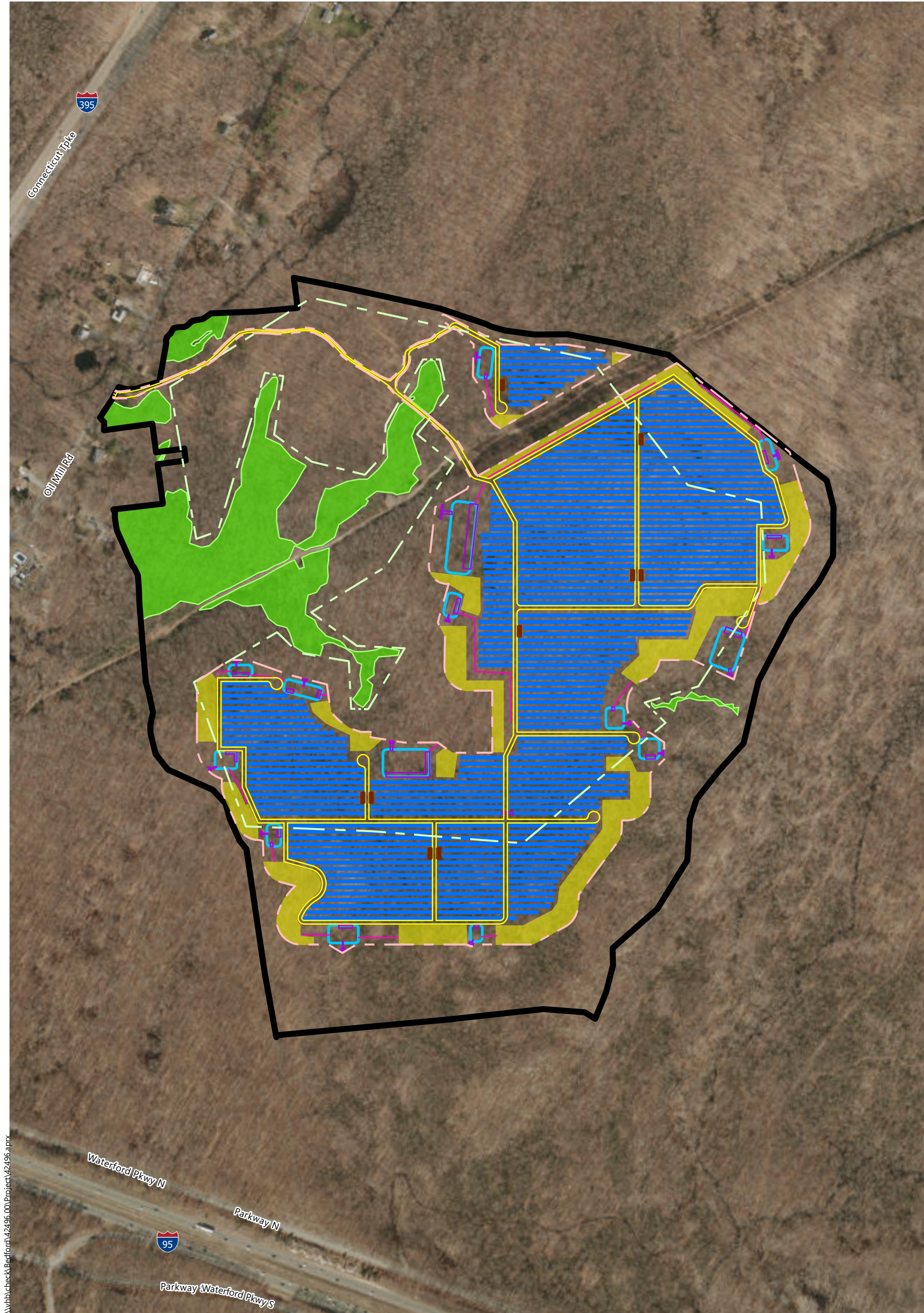
An out-of-date version of the hard copy of Petition Figure 5 was inadvertently put into the binders for the Petition. The .pdf version that is currently on the Council's website for this petition is the correct version that should be used. It should also be noted that the last 14 sheets of Appendix J of the Petition are missing from certain hard copies of the Petition. Greenskies is providing 15 copies of the missing pages for the Council's use. There is no change that needs to be made to the electronic version of Appendix J that is currently on the Council's website.

Respectfully Submitted,  
GRE GACRUX LLC



By:



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Its Attorneys



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**Waterford Solar**

- Parcel Boundary
- Limits of Work/Clearing
- Approximate Limits of Timber Harvest
- Proposed Equipment Pads
- Proposed Access Roads
- Proposed Riprap Spillway
- Proposed Swale

- Proposed Stormwater Basin
- Proposed Solar Panels
- Stumps to Remain

- Delineated Wetland Edge
- Wetland Resource Area

Waterford, Connecticut

**Stump Grubbing Map**

Source: VHB, CTDEEP, ArcGIS Online

**Kochis, Steve**

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**From:** Williams, Neal <Neal.Williams@ct.gov>  
**Sent:** Wednesday, February 26, 2020 3:10 PM  
**To:** Kochis, Steve; Stone, Chris  
**Subject:** [External] Waterford

Good afternoon Steve.

Lee has asked that Chris and I prepare a list of wants derived from our site walk with you. Other than paying very close attention to the offsite impacts there wasn't anything new that we haven't already discussed. Chris and I recall we wanted you to make sure that you slowed down the flows coming off the site. We talked about check dams and rip rap on the natural swales leading off the site. However, there isn't anything we saw that you had missed or that we thought had to be included in the SWPCP. Our intention for the inspection was to get an idea of where the basins were to be situated and where the discharges were going.

Please give Chris or me a call should you have any questions, Neal

Neal M. Williams  
Water Permitting and Enforcement  
Bureau of Materials Management and Compliance Assurance  
Connecticut Department of Energy and Environmental Protection  
79 Elm Street, Hartford, CT 06106-5127  
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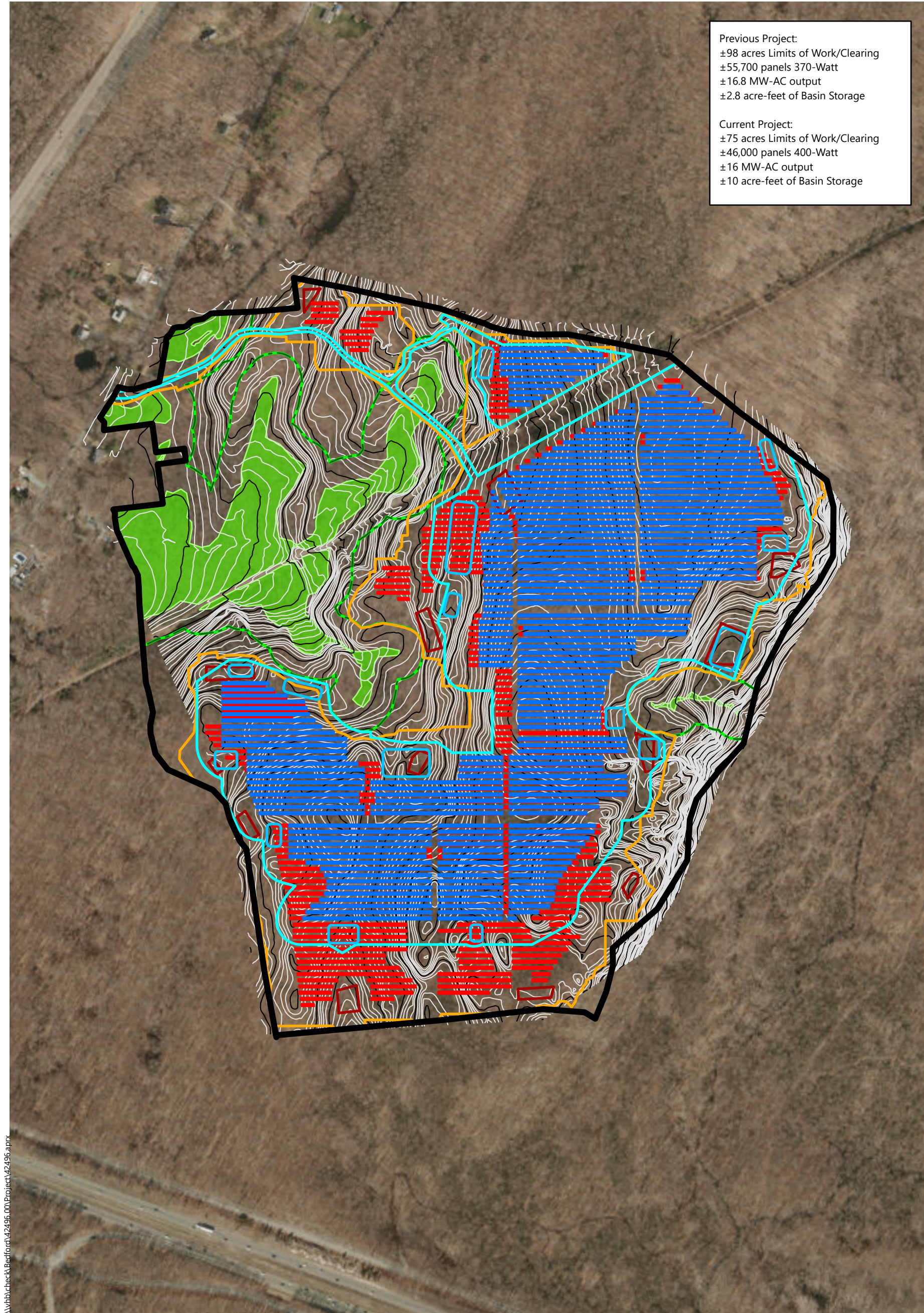


Connecticut Department of  
**ENERGY &  
ENVIRONMENTAL  
PROTECTION**

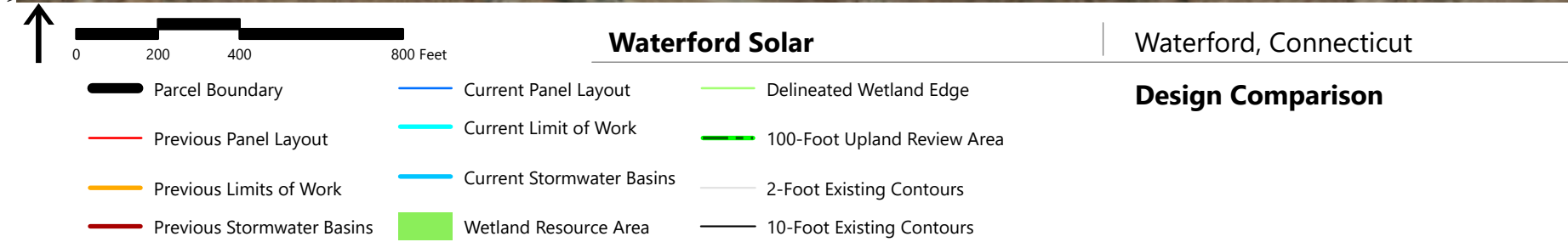
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***Conserving, improving and protecting our natural resources and environment;  
Ensuring a clean, affordable, reliable, and sustainable energy supply.***



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## Exhibit D

### APPENDIX I Stormwater Management at Solar Array Construction Projects

Solar development has expanded over the last several years as Connecticut and other states have invested in this important resource to further greenhouse gas emission reductions and other renewable policy objectives. However, the large amount of impervious surface inherent in the construction of a large-scale solar array is unlike most other construction activities regulated under the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities (“general permit”) and entails challenges not encountered in traditional development projects. If not properly managed, stormwater discharged during and after the construction of solar arrays can be a significant source of pollution resulting from increased runoff, erosion, and sedimentation, which can adversely impact wetlands or other natural resources. It is vitally important to stabilize soil, minimize soil disturbance and soil compaction, and manage the total runoff volume and velocity. Proper stormwater management practices can significantly mitigate the loss of topsoil, erosion and sediment discharges from disturbed areas and stormwater outlets, and erosion along downstream channels and streambanks. The opportunities to properly manage runoff decrease as site imperviousness increases.

Therefore, in addition to the terms and conditions of the general permit, registrations for construction of a Solar Array (as that term is defined in Section 2 of the general permit) shall, at a minimum, adhere to the conditions listed below. Depending on site-specific conditions for a particular solar array construction project, additional analyses may be required.

#### **Design and construction requirements**

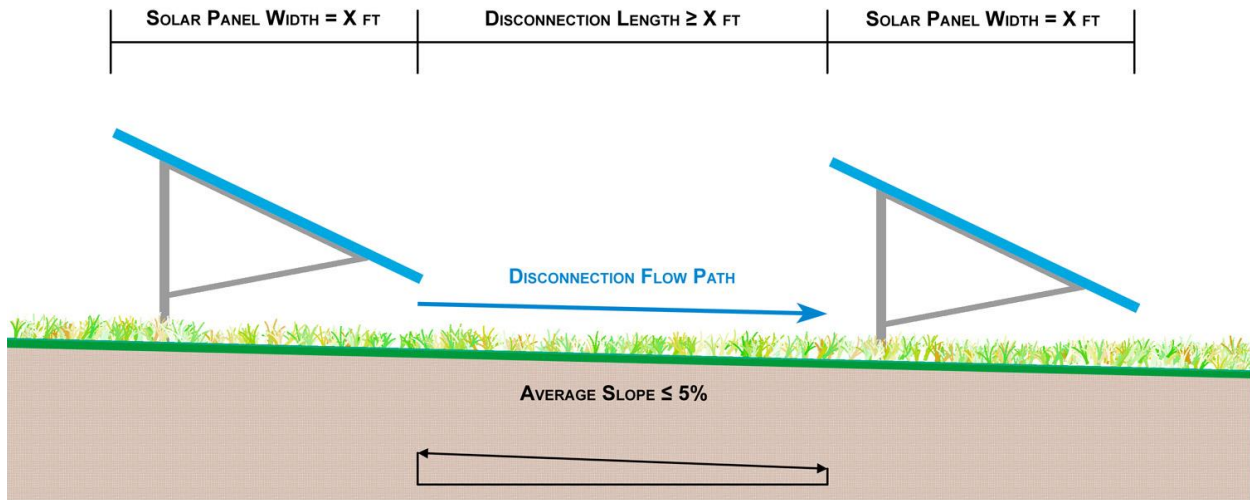
- (1) Roadways, gravel surfaces and transformer pads within the solar array are considered effective impervious cover for the purposes of calculating Water Quality Volume (WQV). In addition to these impervious surfaces, all solar panels in the array shall also be considered effective impervious cover for the purposes of calculating the WQV if the proposed post-construction slopes at a site are equal to or greater than 15% or if the post-construction slopes at a site are less than 15% and the conditions in (a) – (e), inclusive, below have not been met:
  - (a) The vegetated area receiving runoff between rows of solar panels (see Figures 1 and 2, below) is equal to or greater than the average width of the row of solar panels draining to the vegetated area;
  - (b) Overall site conditions and solar panel configuration within the array are designed and constructed such that the runoff remains as sheet flow across the entire site;
  - (c) The following conditions are satisfied regarding the design of the post-construction slope of the site:
    - For slopes less than or equal to 5%, appropriate vegetation shall be established as indicated in Figure 1, below; and
    - for slopes greater than 5%, but less than 10%, practices including, but not limited to, level spreaders, terraces or berms as described in Figure 2, below, shall be used to ensure long term sheet flow conditions; and
    - for sites with slopes greater than or equal to 8%, erosion control blankets or stump grindings or erosion control mix mulch or hydroseed with tackifier shall be applied within 72 hours of final grading, or when a rainfall of 0.5 inches or greater is predicted within 24 hours, whichever time period is less; and
    - for slopes equal to or greater than 10% and less than 15%, the Plan includes specific engineered stormwater control measures with detailed specifications that are designed to provide permanent stabilization and non-erosive conveyance of runoff to the property line of the site or downgradient from the site.

- (d) The solar panels shall be designed and constructed in such a manner as to allow the growth of vegetation beneath and between the panels.
  - (e) A one-hundred (100) foot buffer shall be maintained between any part of the solar array and any of the following: “wetland” as defined in Conn. Gen. Stat. § 22a-29, “wetlands” as defined in Conn. Gen. Stat. § 22a-38, or “waters” as defined in Conn. Gen. Stat. § 22a-423, which shall include vernal or intermittent waters. The buffer shall consist of undisturbed existing vegetation or native shrub plantings.
- (2) The lowest vertical clearance of the solar panels above the ground should not be greater than ten (10) feet. The panels shall, however, be at an adequate height to support vegetative growth and maintenance beneath and between the panels. If the lowest vertical clearance of the solar panels above the ground is greater than ten (10) feet, non-vegetative control measures will be required to prevent/control erosion and scour along the drip line or otherwise provide energy dissipation from water running off the panels.
  - (3) The registrant shall include staff from the appropriate District (see Appendix F) along with the design professional in a pre-construction meeting pursuant to Section 3(b)(15) of this general permit prior to commencement of any construction activity on the site. The date of such meeting and a report summarizing the meeting shall be included in the registrant’s Plan.
  - (4) The registrant shall ensure that a qualified professional engineer serves as the qualified inspector for the purposes of the routine inspections in Section 5(b)(4) of this general permit. Unless otherwise approved in writing by the Commissioner, such qualified professional shall be retained for the duration of the construction project until the Notice of Termination has been submitted to the Commissioner and determined to be acceptable, as described below in paragraph (7) below. The registrant shall also ensure that the credentials for the qualified professional proposed by the registrant and the proposed inspection checklist prepared by such qualified professional are submitted for the review and approval of the Commissioner and are included with the registration for the general permit. No other professional may serve as the qualified professional without the prior submittal of relevant credentials and inspection checklist for the Commissioner’s review and written approval.
  - (5) In addition to the requirements of this general permit regarding inspection checklists and inspection reports, the registrant shall ensure that a copy of all such checklists and reports are submitted electronically to the Department email (DEEP.stormwaterstaff@ct.gov) within three (3) days from the date an inspection of the site was performed.
  - (6) The permittee shall notify the appropriate District (see Appendix F of this general permit) when construction begins and when each phase of construction is complete. The District shall then conduct Plan Implementation, Interim, Post-Construction and Final Stabilization inspections in accordance with Appendix F and Section 6(a) of the general permit.
  - (7) The registrant shall ensure, after completion of a construction project, that a Notice of Termination is filed in compliance with Section 6 of this general permit, including the requirement that such Notice of Termination be signed by a District representative certifying that such District representative has personally conducted a Post-Construction Inspection and Final Stabilization Inspection in accordance with Section 6(a) of this general permit and verified compliance with the requirements of that section.
  - (8) Prior to undertaking construction activity, the registrant shall secure a letter of credit. The amount of the Letter of Credit shall be \$15,000.00 per acre of disturbance. The wording of such letter of credit must be identical to the wording specified in Appendix J of the general permit. The Permittee shall maintain such letter of credit in effect until the Commissioner notifies the permittee that the Notice of Termination, filed in compliance with Section 6 of the general permit has been accepted by the Commissioner.

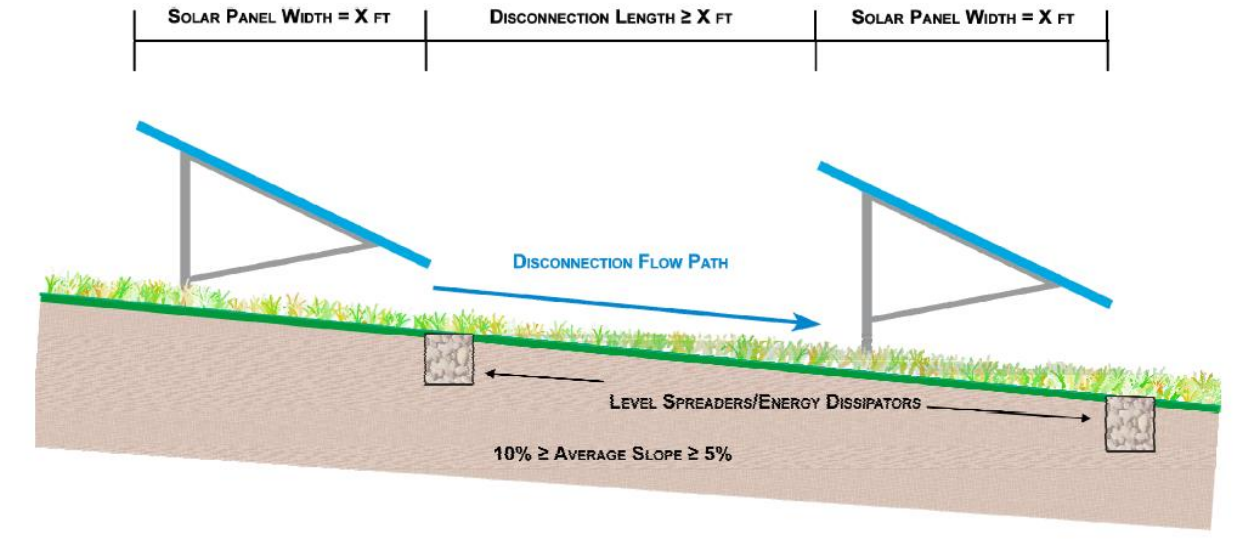
**Design requirements for post-construction stormwater management measures.**

- (1) Post-construction stormwater control measures shall be designed and constructed to provide permanent stabilization and non-erosive conveyance of runoff to the property line of the site or downgradient from the site.
- (2) Orientation of panels shall be considered with respect to drainage pattern, flow concentration, drainage area and velocity (i.e. rows perpendicular to the contours may result in higher runoff).
- (3) The permittee shall conduct a hydrologic analysis that:
  - (a) Evaluates 2, 25, 50 and 100-year storm post-construction stormwater flows; and
  - (b) Is based on site specific soil mapping to confirm soil types; and
  - (c) Is able to determine and confirm the infiltrative capacity of any stormwater management measures and, in addition, reflects a reduction of the Hydrologic Soil Group present on-site by one (1) step (e.g. soils of HSG B shall be considered HSG C) to account for the compaction of soils that results from extensive machinery traffic over the course of the construction of the array; and
  - (d) Is based on slope gradient, surveyed soil type (adjusted per subparagraph (c), above), infiltration rate, length of slope, occurrence of bedrock, and change in drainage patterns (see also page 23 at [https://www.ct.gov/deep/lib/deep/Permits\\_and\\_Licenses/Land\\_Use\\_Permits/Inland\\_Water\\_Permits/IWRD\\_inst.pdf](https://www.ct.gov/deep/lib/deep/Permits_and_Licenses/Land_Use_Permits/Inland_Water_Permits/IWRD_inst.pdf)); and
  - (e) For an engineered stormwater management system, demonstrates no net increase in peak flows, erosive velocities or volumes, or adverse impacts to downstream properties.

**Figure 1**  
**Solar Panel Installation with Slopes  $\leq 5\%$**

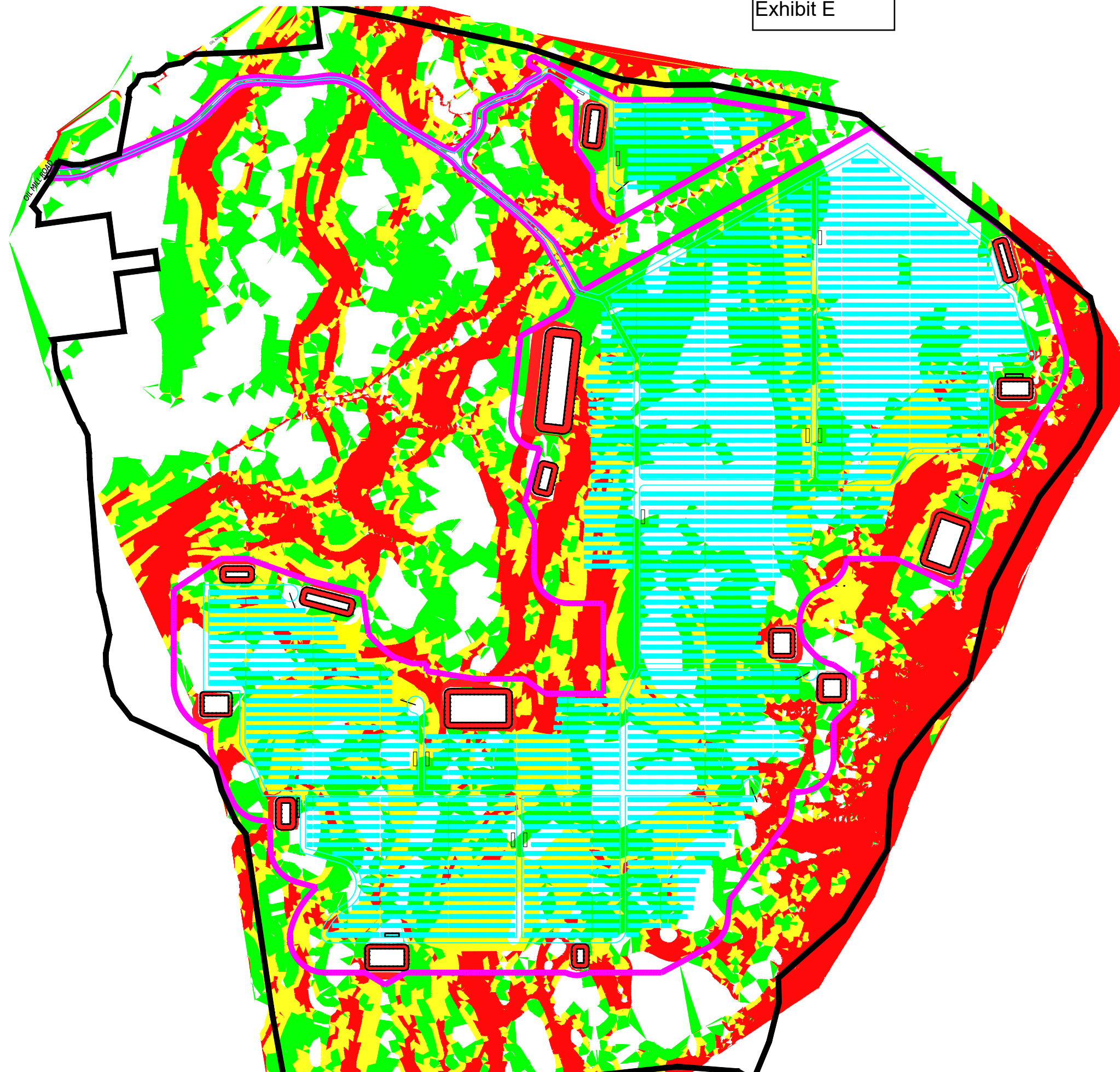


**Figure 2**  
**Solar Panel Installation with Slopes  $> 5\%$  and  $\leq 10\%$**





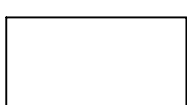



Source: Maryland Department of the Environment: Stormwater Design Guidance – Solar Panel Installations

Exhibit E



POST-CONSTRUCTION SLOPES  
VHB  
MARCH 17, 2020  
SCALE: 1"=300'

LEGEND:

-  LIMITS OF WORK/CLEARING
-  PROPOSED INFRASTRUCTURE
-  0 TO 5% SLOPE
-  5 TO 10% SLOPE
-  10 TO 15% SLOPE
-  >15% SLOPE

1. WORK ASSOCIATED WITH THIS SCOPE SHALL BE PERFORMED BY A CONTRACTOR WHO IS LICENSED IN THE STATE OF THE PROJECT TO INSTALL PHOTOVOLTAIC SYSTEMS.

2. ALL WORK SHALL BE IN STRICT ACCORDANCE WITH THE LATEST ADOPTED VERSIONS OF ALL LOCAL, STATE, AND NATIONAL CODES, INCLUDING ALL ORDINANCES AND LAWS APPLICABLE TO THIS JURISDICTION.

3. ALL CONNECTIONS AND CONFIGURATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S WIRING DIAGRAMS AND INSTALLATION INSTRUCTIONS.

4. POLARITY OF ALL COMPONENTS SHALL MATCH DESIGNATIONS AS DIRECTED BY MANUFACTURER'S REPRESENTATIVE.

5. SET INVERTER OVER/UNDER FREQUENCY SETTINGS AND OVER/UNDER VOLTAGE SETTINGS TO VALUES NOTED IN TABLES ON THIS SHEET.

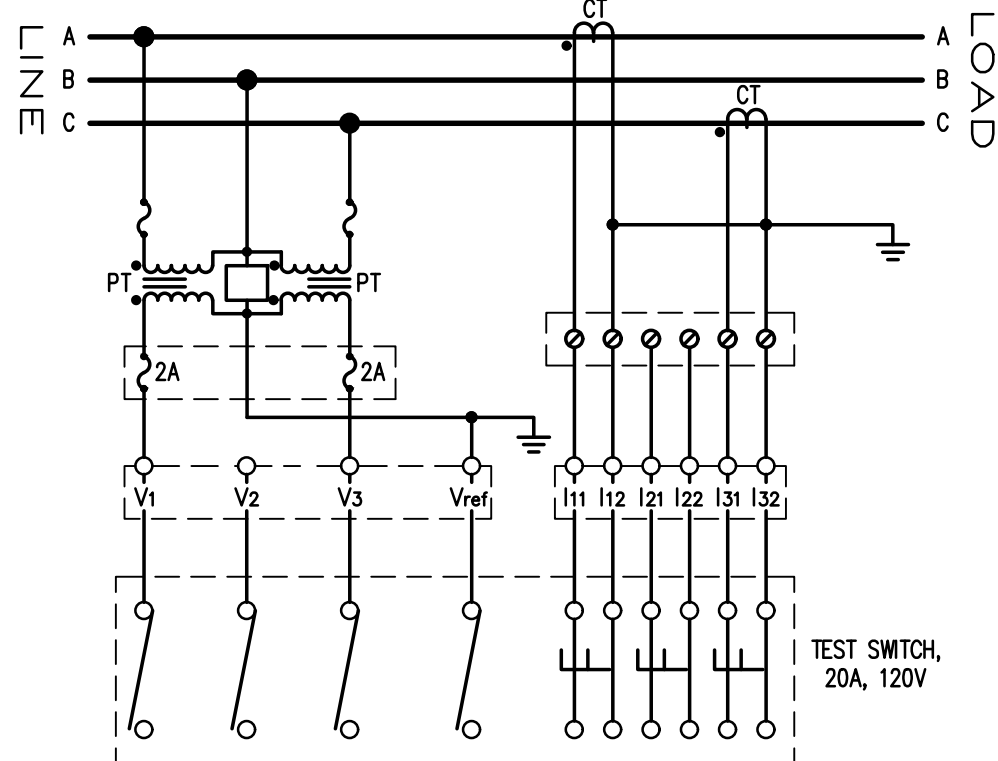
6. SET PRIMARY SWITCH.

7. PADMOUNTED SWITCHGEAR S&C METAL ENCLOSED SWITCHGEAR OR EQUIVALENT, 25KV SYSTEM CLASS, 95BIL, 3 PHASE, 600A MAXIMUM CONTINUOUS CURRENT. SEE ONE-LINE DIAGRAM FOR ADDITIONAL REQUIREMENTS.

8. PADMOUNTED SWITCHGEAR, S&C METAL ENCLOSED SWITCHGEAR METERING BAY OR EQUIVALENT PER UTILITY COMPANY REQUIREMENTS, 25KV NOMINAL VOLTAGE, 600 AMPERE CONTINUOUS RATING, 95KV BIL, CT RATED TO BE 600:5 WITH 0.3% ACCURACY AND THE PT RATED TO BE 110:1. SEE ONE-LINE DIAGRAM FOR ADDITIONAL REQUIREMENTS.

9. PADMOUNTED UNDERGROUND DISTRIBUTION SWITCHGEAR, S&C VISTA SWITCHGEAR OR EQUIVALENT, 27KV SYSTEM CLASS, 95KV BIL, 3 PHASE, 600A MAXIMUM CONTINUOUS CURRENT. SEE ONE-LINE DIAGRAM FOR ADDITIONAL REQUIREMENTS.

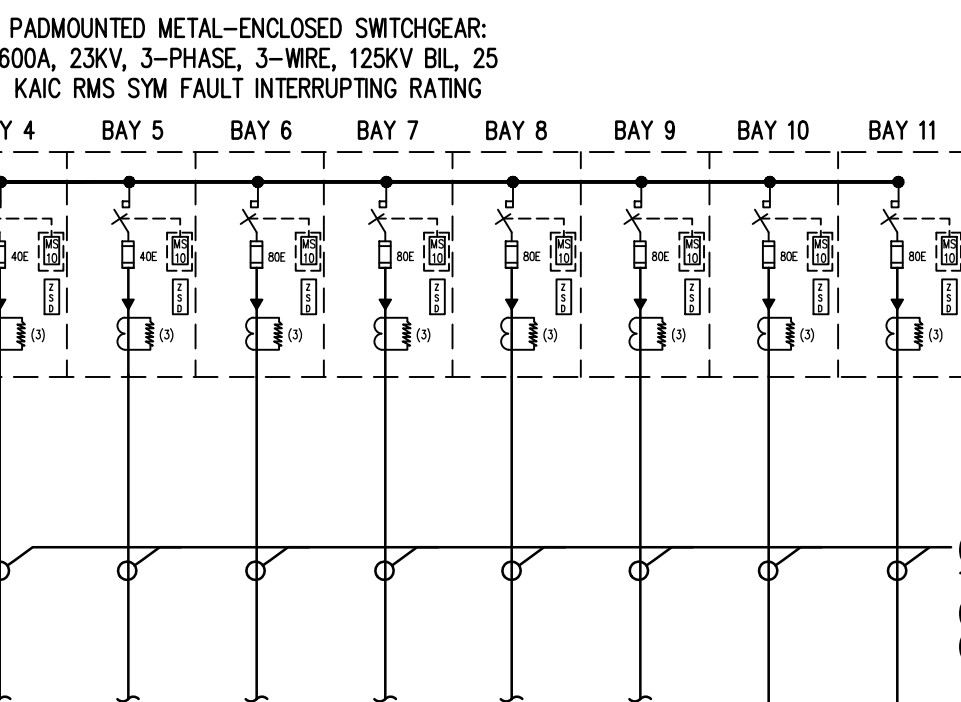
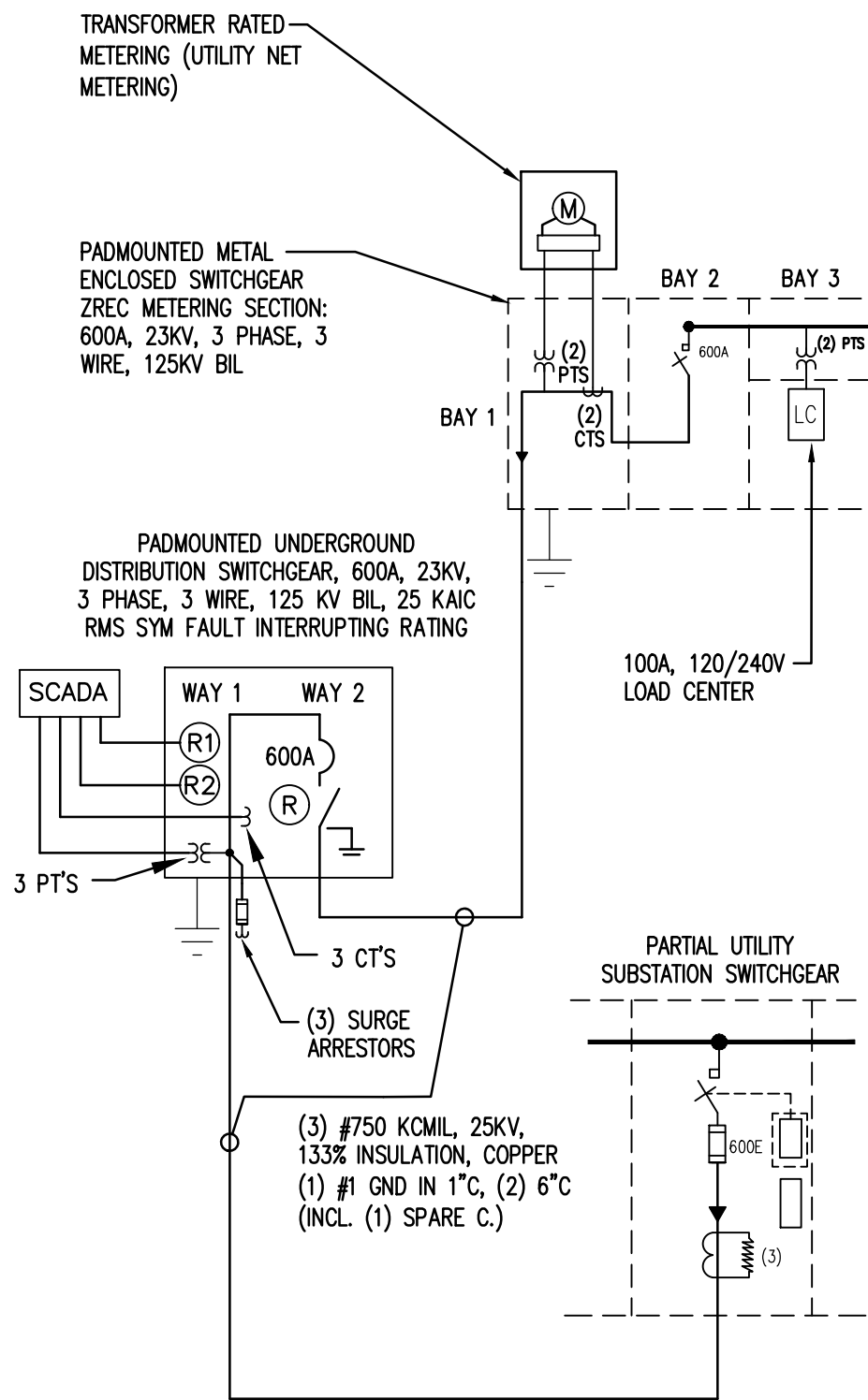
10. EXISTING UTILITY VOLTAGE SHOWN IS ASSUMED, AND SHALL BE VERIFIED DURING THE DESIGN PHASE.



1 TYPICAL 3-LINE UTILITY METER WIRING SCHEMATIC  
SCALE: N.T.S.

UTILITY INFORMATION

UTILITY SUBSTATION	VOLTAGE	CIRCUIT NUMBER
WATERFORD STATION	23KV	-



SEE DRAWING PV-1B, PV-1C & PV-1D FOR CONTINUATION.

INVERTER SPECS.

MANUFACTURER	SOLECTRIA RENEWABLES
MODEL	XGI 1000-65
DC RATING	
V-MAX	1000 V
I - MAX OPERATING	27.65A PER MPPT (110.6A)
STRING FUSE RATING	15A, 1000VDC, FAST ACTING
AC RATING	
P-OUT	65 KW
V-NOM	480 V 3-PH, 4 WIRE, WYE
I-OUT	78.2 A

INVERTER SPECS.

MANUFACTURER	SOLECTRIA RENEWABLES
MODEL	XGI 1000-60
DC RATING	
V-MAX	1000 V
I - MAX OPERATING	26.4A PER MPPT (105.6A)
STRING FUSE RATING	15A, 1000VDC, FAST ACTING
AC RATING	
P-OUT	60 KW
V-NOM	480 V 3-PH, 4 WIRE, WYE
I-OUT	72.2 A

PV MODULE SPEC

MANUFACTURER	NEO SOLAR POWER
MODEL	DEM 370 E4A
PEAK POWER WATTS	370W
MAXIMUM POWER VOLTAGE	39.4V
MAXIMUM POWER CURRENT	9.41A
OPEN CIRCUIT VOLTAGE	47.81V
SHORT CIRCUIT CURRENT	9.89A

SYSTEM INFORMATION

PROJECT TITLE	SOLAR INSTALLATION
AC SYSTEM/DC SYSTEM	16.78MW AC/ 20.61MW DC

PRIMARY SWITCH TRIP SETTINGS

BASE VOLTAGE	PROTECTIVE RELAY	TRIP SETTING	VOLTAGE (VAC)	CLEARING TIME (s)
120V	27-1	50%	60.0V	0.16
	27-2	88%	105.6V	2.00
	59-1	110%	132.0V	1.00
	59-2	120%	144.0V	0.16

PRIMARY SWITCH TRIP SETTINGS

SYSTEM SIZE	PROTECTIVE RELAY	FREQUENCY (Hz)	CLEARING TIME (s)
17.73 MW	810-1	60.5	0.16
	81U-1	59.3	32
	81U-2	57.5	11.0
	81U-3	57.0	0.16

SYSTEM INFORMATION

PROJECT TITLE	SOLAR INSTALLATION
INVERTERS	65kW and 60kW

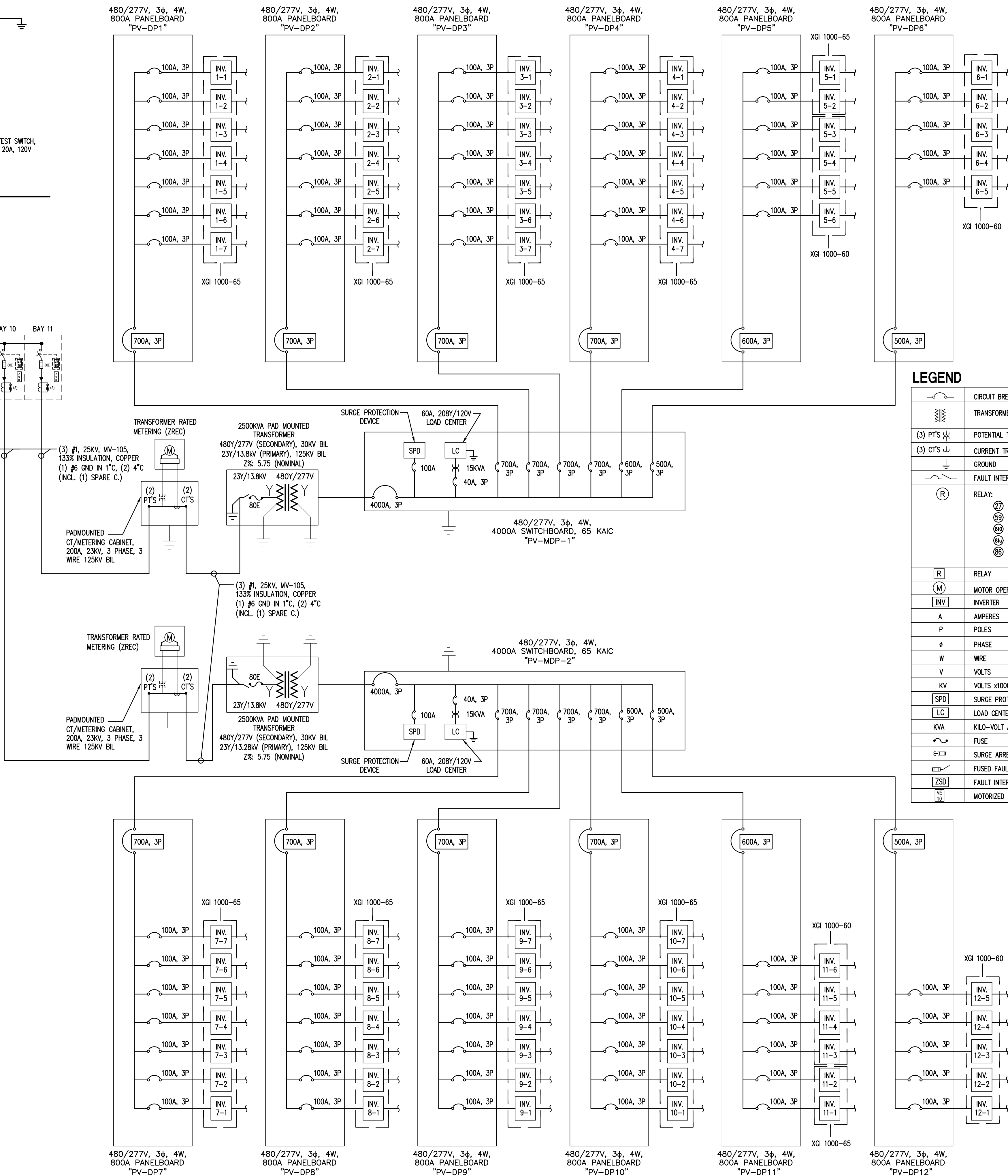
INVERTER TRIP SETTINGS

BASE VOLTAGE	PROTECTIVE RELAY	VOLTAGE (VAC)	CLEARING TIME (s)
480V	27-1	240V	0.16
	27-2	422V	2.00
	59-1	528V	1.00
	59-2	576V	0.16

INVERTER TRIP SETTINGS

SYSTEM SIZES	PROTECTIVE RELAY	FREQUENCY (Hz)	CLEARING TIME (s)
60 kW AND 65 kW	810-1	60.5	0.16
	81U-1	59.3	32
	81U-2	57.5	11.0
	81U-3	57.0	0.16

Exhibit F



2 ONE LINE POWER DIAGRAM  
SCALE: N.T.S.

FOR INTERCONNECTION APPLICATION PURPOSES.  
NOT FOR CONSTRUCTION.

LEGEND

	CIRCUIT BREAKER
	TRANSFORMER
(3) P.T.S.	POTENTIAL TRANSFORMER
(3) C.T.S.	CURRENT TRANSFORMER
	GROUND
	FAULT INTERRUPTER
(R)	RELAY:
	27 PROTECTIVE RELAY - UNDER VOLTAGE
	59 PROTECTIVE RELAY - OVER VOLTAGE
	80 PROTECTIVE RELAY - OVER FREQUENCY
	81 PROTECTIVE RELAY - UNDER FREQUENCY
	85 PROTECTIVE RELAY - MANUAL RESET LOCKOUT RELAY
(R)	RELAY
(M)	MOTOR OPERATOR
(INV)	INVERTER
A	AMPERES
P	POLES
#	PHASE
W	WIRE
V	VOLTS
KV	VOLTS x1000
(SPD)	SURGE PROTECTION DEVICE
(LC)	LOAD CENTER
KVA	KILO-VOLT AMPERES
	FUSE
	SURGE ARRESTOR
	FUSED FAULT INTERRUPTER
(ZSD)	FAULT INTERRUPTER RELAY
(MS)	MOTORIZED SWITCH OPERATOR

355 Research Parkway  
Meriden, CT 06450  
(203) 630-1406  
(203) 630-2615 Fax

<b>REVISIONS</b>	<b>No.</b>	<b>Date</b>	<b>Description</b>	
	1.	04/23/2018	PER UTILITY COMMENTS.	
	1.	06/08/2018	SITING COUNCIL SUBMISSION	

---

<b>Designed by</b>	SC
<b>Drawn</b>	PS/CJA
<b>Reviewed</b>	
<b>Scale</b>	AS NOTED
<b>Project No.</b>	17D3515
<b>Date</b>	02/28/2018
<b>CAD File:</b>	PV17D3515D

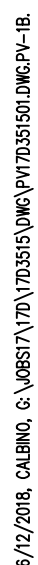
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**Title**

# PHOTOVOLTAIC ONE-LINE POWER RISER DIAGRAM

Sheet No. \_\_\_\_\_

PV-1B



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(ref (s) : 80170351502
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**BL Companies**  
Architecture  
Engineering  
Environmental  
Land Surveying

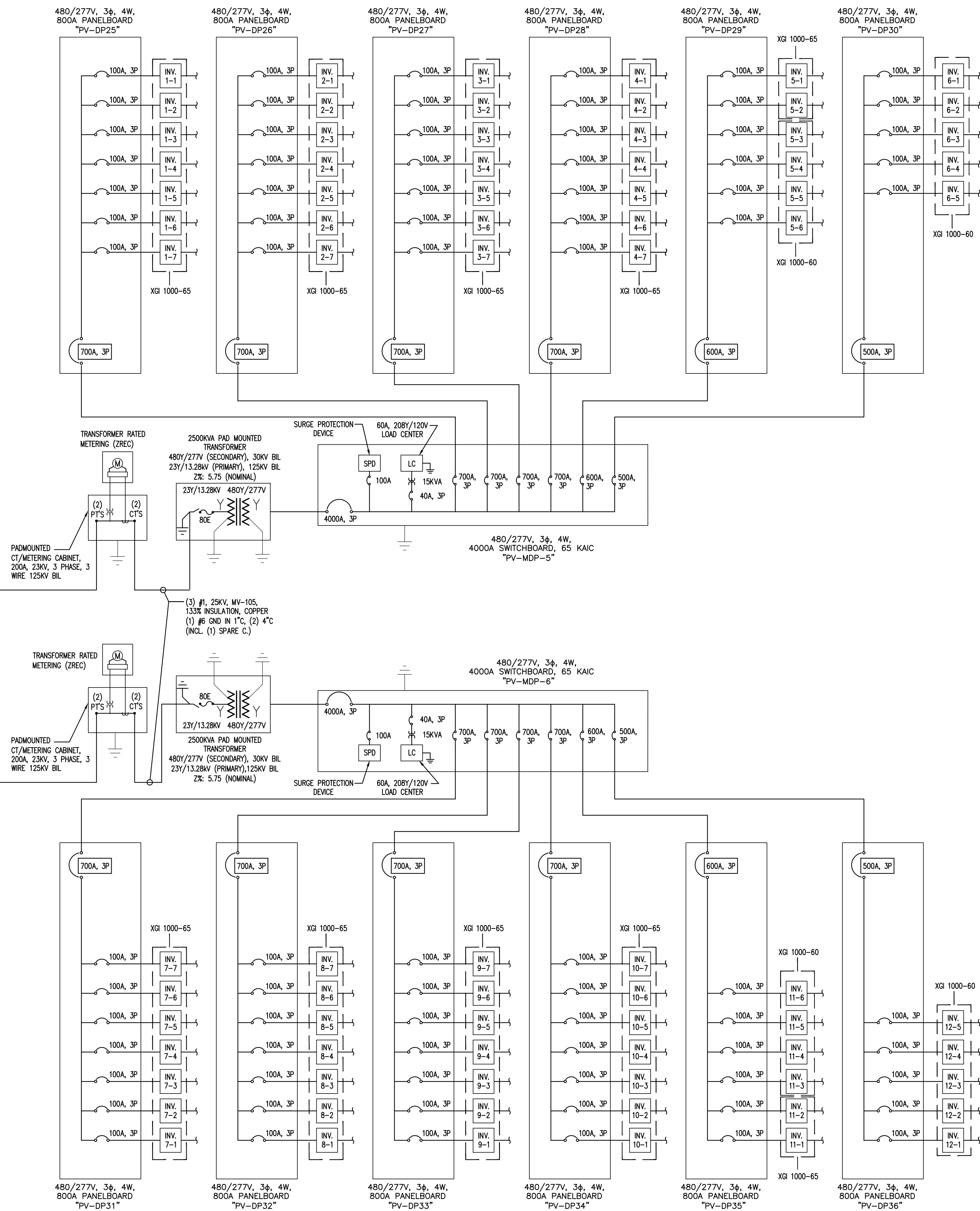
117 OIL MILL ROAD  
WATERFORD, CONNECTICUT

igned  
wn PS,

□

## PHOTOVOLTAIC NE-LINE POWER USER DIAGRAM

PV-1C



5/12/2018, CALEBINO, G:\08517\170\1703515\DMG\P\170351501.DMG,PV-1C,

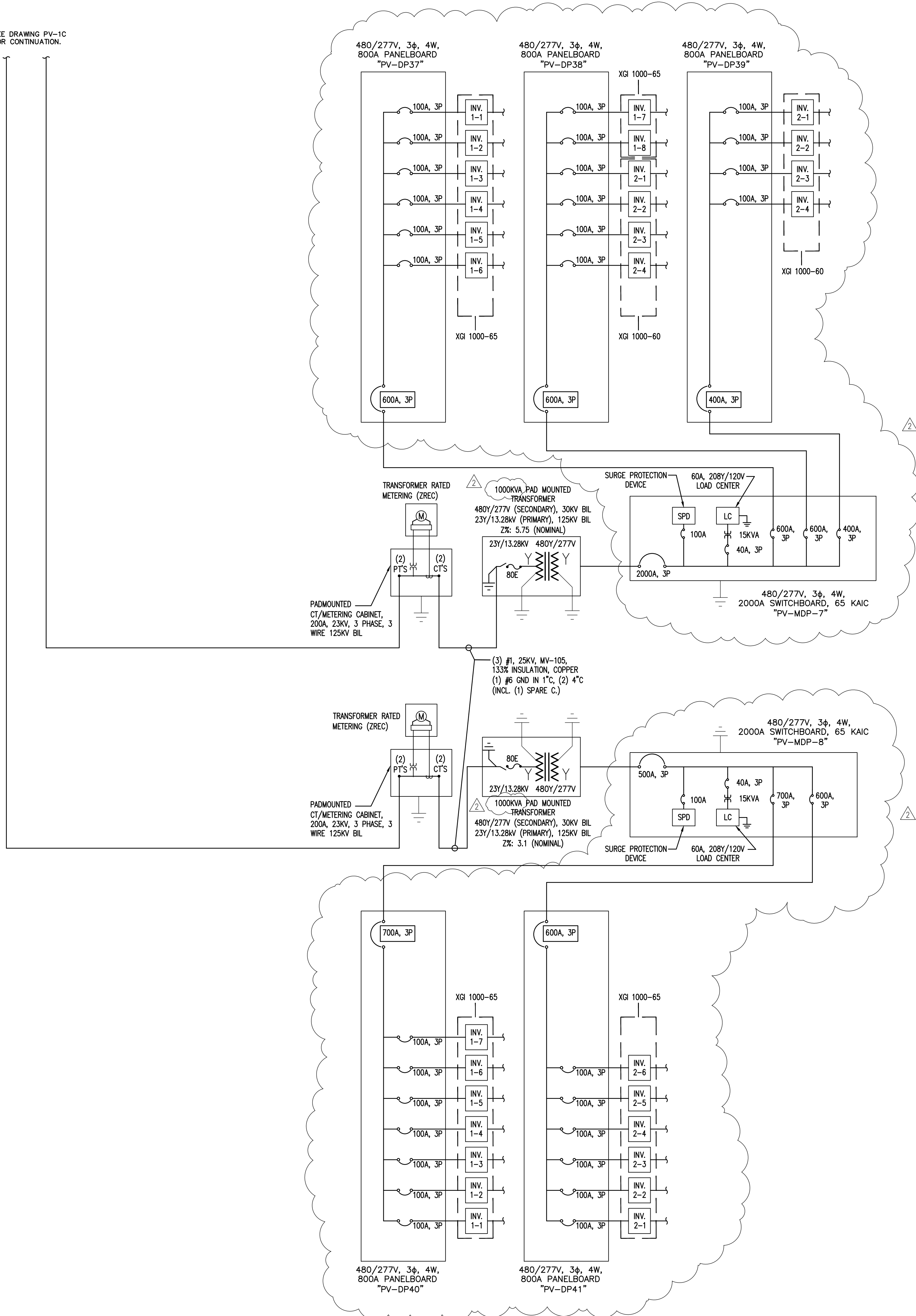
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$$Y_{\text{total}}(s) = \text{DDTDTIEEO}$$

6/12/2018, CALDWAY, C. J. 10851710170155510MP17033515101-MDP-1-15

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SEE DRAWING PV-1C  
FOR CONTINUATION.



FOR INTERCONNECTION APPLICATION PURPOSES.  
NOT FOR CONSTRUCTION.



355 Research Parkway  
Meriden, CT 06450  
(203) 630-1406  
(203) 630-2615 Fax

PHOTOVOLTAIC INSTALLATION  
117 OIL MILL ROAD  
WATERFORD, CONNECTICUT

REVISIONS	Des:	PER UTILITY COMMENTS
No.	Date	SYNCHRONOUS SUBMISSION
1.	04/23/2018	
1.	06/06/2018	

Designed SC  
Drawn PS/CJA  
Reviewed  
Scale AS NOTED  
Project No. 1703515  
Date 02/28/2018  
CAD File: PV170351501

Title  
PHOTOVOLTAIC  
ONE-LINE POWER  
RISER DIAGRAM

Sheet No.

PV-1D

Ver C3 : 07/03/2022

February 28, 2020

Jeffrey Shamas  
Vanasse Hangen Brustlin, INC  
100 Great Meadow Rd, Suite 200  
Wethersfield, CT 06109  
[JSHAMAS@VHB.COM](mailto:JSHAMAS@VHB.COM)

**NDDB DETERMINATION NUMBER:** 201914884

**Project:** Installation of Photovoltaic Electric Generating Facility GRE Gacrux, LLC Located at 117 Oil Mill Road in Waterford, CT

**Expiration:** February 28, 2022

I have reviewed Natural Diversity Data Base (NDDB) maps and files regarding this project. According to our records, the following State-listed species (RCSA Sec. 26-306) are in the area of or may be influenced by your project.

- **Eastern ribbonsnake (*Thamnophis sauritus*) State Special Concern**
- ***Acalypha virginica* (Virginia copperleaf) State Special Concern**

**Eastern ribbonsnake (*Thamnophis sauritus*)**

Eastern ribbon snakes inhabit areas with shallow water, grassy or shrubby areas bordering streams and wooded swamps. They also prefer sunny areas with low dense vegetation near shallow water areas. Their diet consists of insects, fish, frogs, salamanders and toads. They are dormant between Oct 15- March 31.

I concur with your recommendations to protect ribbonsnake with additional protection measures up to 300ft. Your protection measures include 100 ft, no disturbance buffers of wetlands, and no planned disturbance in the utility ROW. You include allowances for limited disturbance in the 100-200ft wetland buffer. Additionally, if work, traffic, or staging will occur within the 300ft wetland buffer of "wetland 1" during the snakes active season (between April 1- Oct 15), apply the following avoidance measures:

- A contractor awareness program will be developed and implemented to ensure that contractors working in the area have been instructed on the proper response in the event that an eastern ribbonsnake is observed in the work area.
- If any snakes are observed, construction personnel will safely relocate them to an area immediately outside of the work area.
- Any silt fence utilized will be removed after clearing is complete and soils are stabilized.
- Any confirmed eastern ribbon snake sightings will be reported to the NDDB.

***Acalypha virginica* (Virginia copperleaf)**

This plant is found in dry, open soils and bloom in August- September.

This plant was identified in your plant surveys and listed in Attachment 4, Observed Vascular Plant List. Delineate and avoid impacts to this plant from construction activities. Where possible, encourage habitat characteristics that will promote the plant onsite. Additionally, please forward the location information to our program for our records.

This is determination is valid for two years.

---

Natural Diversity Data Base information includes all information regarding critical biological resources available to us at the time of the request. This information is a compilation of data collected over the years by the Department of Energy and Environmental Protection's Bureau of Natural Resources and cooperating units of DEEP, independent conservation groups, and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Consultations with the NDDB should not be substituted for on-site surveys required for environmental assessments. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as, enhance existing data. Such new information is incorporated in the NDDB as it becomes available.

Please contact me if you have any questions ([shannon.kearney@ct.gov](mailto:shannon.kearney@ct.gov)). Thank you for consulting with the Natural Diversity Data Base and continuing to work with us to protect State-listed species.

Sincerely,

/s/ Shannon B. Kearney  
Wildlife Biologist