



# STATE OF CONNECTICUT

## CONNECTICUT SITING COUNCIL

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### CERTIFIED MAIL RETURN RECEIPT REQUESTED

October 26, 2018

Lee D. Hoffman, Esq.  
Pullman & Comley, LLC  
90 State House Square  
Hartford, CT 06103-3702

RE: **PETITION NO. 1347** – 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-megawatt 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.

Dear Attorney Hoffman:

At a public meeting held on October 25, 2018, the Connecticut Siting Council (Council) considered and denied without prejudice the petition for a declaratory ruling for the above-referenced proposed solar photovoltaic electric generating facility based on concerns from the Connecticut Department of Energy and Environmental Protection regarding a recommended wildlife survey in correspondence submitted to the Council on August 24, 2018.

Enclosed for your information is a copy of the staff report.

Very truly yours,

Robert Stein  
Chairman

Enclosure: Staff Report dated October 25, 2018

c: Parties and Intervenors



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### Petition No. 1347

### GRE GACRUX LLC Solar Facility

### Oil Mill Road, Waterford

### Staff Report

October 25, 2018

### Introduction

On June 20, 2018, GRE GACRUX LLC (GRE or Petitioner) submitted a petition to the Connecticut Siting Council (Council) for a declaratory ruling pursuant to Connecticut General Statutes (CGS) §4-176 and §16-50k for the construction, operation and maintenance of a 16.78 megawatt (MW) alternating current (AC) solar photovoltaic electric generating facility located at 117 Oil Mill Road in Waterford, and includes an associated electrical interconnection to Eversource's Waterford Parkway North Substation in Waterford.

GRE would be the owner of the proposed project. Greenskies, an affiliated entity and part of the Clean Focus group of companies, specializes in system design, financing, project implementation, operation, and maintenance. GRE would obtain necessary permits from Department of Energy and Environmental Protection (DEEP). GRE would also secure the necessary local building and electrical permits.

On or about June 5 and 7, 2018, the Petitioner notified Town of Waterford (Town) officials, state officials and agencies, the property owner and abutting property owners of the proposed project.

On June 22, 2018, the Council sent correspondence to the Town stating that the Council has received the Petition and invited the municipality to contact the Council with any questions or comments by July 20, 2018.

On July 13, 2018, the Town requested party status. The Council granted the Town party status on July 19, 2018. On August 20, 2018, Save the River-Save the Hills, Inc. (STRSTH) requested intervenor status. On August 30, 2018, the Council granted STRSTH intervenor status.

On July 25, 2018 a public field review of the proposed project was conducted. The field review was attended by Council members Michael Harder and Robert Hannon, Council staff members Ifeanyi Nwankwo and Robert Mercier, Linda Brunza, Environmental Analyst from DEEP, Town representatives Brian Long, Maureen Fitzgerald, Mark Wujtecwicz, GRE representatives Lee Hoffman, Esq., Christopher Albino, John Schmitz, Ryan Linnces, and property owners Rosalie Watson and Todd Willis.

The Council issued interrogatories to GRE on August 2, 2018. On September 7, 2018, GRE submitted responses to the Council's interrogatories. On September 21, 2018, STRSTH submitted interrogatories to GRE and GRE responded on October 12, 2018. On September 21, 2018, GRE submitted interrogatories to STRSTH and STRSTH responded on October 12, 2018.

On August 2, 2018, pursuant to CGS §4-176(e) of the Uniform Administrative Procedure Act, which requires an administrative agency to take action on a petition within 60 days of receipt, the Council voted to set the date by which to render a decision on this petition by December 17, 2018. This date is the statutorily-mandated 180-day decision deadline for this petition under CGS §4-176(i).



CONNECTICUT SITING COUNCIL

Affirmative Action / Equal Opportunity Employer

### **Municipal Consultation**

GRE met with Waterford First Selectman Daniel Steward, Director of Public Works Brian Long, Director of Economic Development Abby Piersall and Environmental Planner Maureen Fitzgerald on April 26, 2018 to discuss the project. The Town requested that GRE submit completed engineered drawings, arrange a tour of an existing GRE solar facility in East Lyme, and the opportunity to participate in any field visits scheduled by the Council. On June 14, 2018, GRE provided the Town with completed Project site plans and toured the existing East Lyme solar facility with Town representatives.

The Town submitted comments to the Council on July 18, 2018, concerning construction sequencing, stormwater management, off-site water quality, site screening, wildlife impacts, construction traffic, and Project decommissioning.

STRSTH submitted comments including a Project review by STRSTH's consultant, Trinkaus Engineering, LLC, to the Council on August 20, 2018 concerning stormwater management at the site and overall degradation of water quality in the Niantic River Watershed.

### **State Agency Comment**

On June 22, 2018, the Council sent correspondence requesting comments on the proposed project by July 20, 2018 from the following state agencies: Department of Agriculture (DOAg); Department of Public Health (DPH); Council on Environmental Quality (CEQ); Public Utilities Regulatory Authority (PURA); Office of Policy and Management (OPM); Department of Economic and Community Development (DECD); Department of Emergency Services and Public Protection (DESPP); Department of Consumer Protection (DCP); Department of Labor (DOL); Department of Construction Services (DCS); Department of Transportation (DOT); the Connecticut Airport Authority (CAA); the State Historic Preservation Office (SHPO) and DEEP.

Upon a request from DEEP dated July 16, 2018, the Council granted an extension of time to August 20, 2018 to submit comments. DEEP submitted comments on August 24, 2018. DEEP's comments are attached. No comments from any other state agencies were received.

### **Public Act 17-218**

Effective July 1, 2017, Public Act 17-218 requires, "for a solar photovoltaic facility with a capacity of two or more megawatts, to be located on prime farmland or forestland, excluding any such facility that was selected by DEEP in any solicitation issued prior to July 1, 2017, pursuant to section 16a-3f, 16a-3g or 16a-3j, the DOAg represents, in writing, to the Council that such project will not materially affect the status of such land as prime farmland or DEEP represents, in writing, to the Council that such project will not materially affect the status of land as core forest." Because the proposed project was selected by DEEP in a solicitation prior to July 1, 2017, the proposed project is exempt from the provisions of Public Act 17-218.

### **Public Benefit**

The project would be a distributed energy resource facility as defined in CGS §16-1(a)(49). CGS §16a-35k establishes the State's energy policy, including the goal to "develop and utilize renewable energy resources, such as solar and wind energy, to the maximum practicable extent." The 2018 Connecticut Comprehensive Energy Strategy emphasizes growth of renewable and zero-carbon generation in the state and region through the promotion of grid-scale renewable energy. The proposed facility will contribute to fulfilling the State's Renewable Portfolio Standard as a zero emission Class I renewable energy source.

On March 9, 2016, pursuant to Section 1(b) and 1(c) of PA 15-107, DEEP issued notice for a Request for Proposals (RFP) for Class I renewable energy sources and Class III sources with a nameplate capacity rating of more than 2 MW and less than 20 MW (Small Scale RFP). Project selection occurred on November 28, 2016. On June 27, 2017, DEEP issued its final determination in the RFP and selected 25 out of 107 proposed projects to enter into long-term power purchase agreements with the electric distribution companies (EDCs) for a combination of energy and environmental attributes. The proposed Project is one of the 25 projects selected.

GRE would be structured as an independent electrical generating entity participating in the ISO-New England, Inc. (ISO-NE) market, selling power to two public utilities via a power purchase agreement (PPA). Specifically, per the PPA, approximately 80 percent of the electricity and renewable energy certificates (RECs) would be sold to Eversource Energy (Eversource), and the remaining 20 percent would be sold to The United Illuminating Company (UI). The PPA was approved by PURA in September 2017 (PURA Docket No. 17-01-11). The PPA has a 20-year term. There are no extensions or options to renew the length of the PPA.

The PPA allows for changes of less than 2 MW in total output. Between the time the PPA was executed and the time the Petition was filed with the Council, GRE reduced the total project output by 0.95 MW due to on-site environmental constraints.

The Project has the potential to participate in the ISO-NE Forward Capacity Auction but under the terms of the PPA, is not obligated to participate. GRE does not intend to participate in Auction 13 for the 2022/2023 commitment period.

### **Project Site**

GRE's site search criteria to develop a solar facility included characteristics such as site availability, minimal impacts to natural resources and residents, and proximity to existing electrical infrastructure for interconnection.

The proposed site is located on an approximate 152.2 acre parcel located at 117 Oil Mill Road in Waterford. The parcel is an interior lot, generally east of Oil Mill Road and north of Interstate 95. A small portion of the parcel has road frontage on Oil Mill Road where an existing dirt road extends eastward into the property.

The parcel is zoned Rural Residential (RU 120) and abuts undeveloped industrially-zoned property to the east and south, single-family residential properties along Oil Mill Road to the west and multifamily residential property to the north. The parcel is located in the western portion of Waterford, generally between Interstate 395 and Interstate 95.

The parcel is characterized by a combination of low lying wetland areas and surrounding forested uplands. Several knolls are interspersed through the interior of the property with steep drop-offs and slopes present along most of the property boundary. In general, topography of the property consists of elevations ranging from 92 feet to 254 feet with a highpoint ridgeline located on the eastern half of the property and extending from north to south. The parcel is undeveloped with the exception of a maintained 125-foot wide Eversource right-of-way (ROW) that extends across the northern portion along a southwest-northeast axis.

In January 2018, the landowner received permitting from the Town to conduct timber harvesting, an agricultural activity, on the property in accordance with the Town's Inland Wetlands and Watercourses and Zoning regulations. As of September 7, 2018, 75 percent of the trees had been harvested. Section 2.3 of the lease executed by GRE and the property owner provides the landowner with rights up to 90 days after commencement of the lease to conduct a timber harvest of all timber on the site and to retain the proceeds obtained from the timber harvest.

GRE has a 20 year lease with the property owner. GRE can extend the lease by an additional 20 years if needed. Upon expiration or termination of the lease, the solar arrays and any related improvements must be removed by GRE.

### **Proposed Project**

The proposed Project would consist of approximately 55,692 solar photovoltaic panels, measuring approximately 6.4 feet by 3.3 feet. The panels are rated at 370 Watts DC and have an efficiency factor of approximately 19.1 percent (the percentage of solar energy that is being converted into useable electricity). The power output of the panels is expected to decline by approximately 0.5 percent per year.

The panels would be arranged two-high in a portrait orientation and set at a 25 degree angle to maximize annual energy production. The panels would extend to an approximate maximum height of 9.5 feet above grade, depending on specific topographic conditions. At their lowest point, the panels would be approximately 3 feet above grade.

The panels would be mounted on a steel racking system that would be supported by either concrete ballast or driven posts, with specific sub-surface conditions determining the installation method. The driven posts would be set 12 feet apart and would require 6 to 8 feet of embedment. If soils are predominantly stone, then screw anchors can be used with a post embedment of 5 to 6 feet. Pre-cast concrete ballasts would be used where soils are shallow to bedrock.

Due to existing topographical and environmental constraints, the majority of the solar arrays would be established in the eastern and southern portions of the site property. With the exception of a few outlying solar arrays in the northern portion of the parcel, the Project would be arranged as one large solar field served by internal gravel roads.

The solar field would be separated into eight distinct power blocks with each section served by a transformer mounted on a concrete pad. Each transformer would be connected to string inverters that collect energy produced by the solar arrays. If there are operational issues with one section of the Project, that section can be isolated at the transformer level, allowing other sections to continue to produce power. The Project cannot serve as a microgrid due to the interconnection design to Eversource's power grid. The Project has not been designed for a battery storage system.

The solar panels would have exterior wiring installed along the racking assembly to each sting inverter (60 - 65 kW rating). Each string inverter would serve 198 to 216 panels. Wiring from the string inverters would be installed within an underground trench to a distribution panel. Wiring from the distribution panels to the transformer pads would be installed within an underground conduit.

The Project would interconnect with Eversource's Waterford Parkway North Substation located at 325 Waterford Parkway North in Waterford, approximately 3,400 feet south of the existing site access road on Oil Mill Road. GRE submitted an Interconnection Application to Eversource. Eversource completed a distribution impact study and ISO-NE is conducting a Transmission Study for the proposed interconnection location. Once the Transmission Study is complete, a draft interconnection agreement will be provided. The interconnection would require the addition of utility runs from the substation to the project site entrance. All work associated with the utility side of the interconnection would be the responsibility of Eversource.

The solar field area would be graded as necessary to achieve slopes conducive to installation of the racking posts and ballasts. If ballast mounts are used on sloping terrain, local grading would be used to create a level, stable surface. Solar panel racking supported by driven posts can be installed on slopes with a grade up to 20 percent. Soil disturbance is also required to install concrete equipment pads, stormwater control features and access roads.

Based on a preliminary geotechnical report that characterized soils on the site, depth to bedrock is variable. Probable bedrock was encountered at depths of about 10 to 20 feet below ground surface. In some cases, completely weathered bedrock was encountered at a depth as shallow as 3.5 feet and competent bedrock at a depth of 10 feet below the weathered bedrock. Exposed rock ledge is estimated to cover approximately 8.6 acres of the solar field area.

Development of the Project site would require the clearing of 97.5 acres of forest. Of the 97.5 acres, grubbing would occur on 91.3 acres to establish the solar field. Site grading to develop the solar field would generate an estimated 22,660 cubic yards of excess soil and rock. Additional soil testing would be conducted in certain areas to further develop site grading and facility component installation plans. Upon completion of an additional geotechnical investigation, also recommended by DEEP in its comments, if the Project is approved, final design and construction details will be provided in the Development and Management (D&M) Plan. The results of this study will inform the final stormwater design with respect to collection, attenuation, infiltration and discharge of runoff.

A 7-foot high chain link fence would be installed around the perimeter of the solar field for site security and to comply with National Electrical Code (NEC) requirements. The perimeter fencing would extend approximately 14,500 linear feet around the solar field areas. A main access gate with locking hardware would be located at the primary site access drive extending from Oil Mill Road. Secondary access gates would be established at the two outlying northern solar fields, at access to the ROW and to the stormwater detention basins located throughout the site. A total of 3 double swing gates and 18 single swing gates would control access to different areas of the site.

Access to the Project site is located in the northwest corner of the parcel where an existing dirt road extends eastward from Oil Mill Road for 1,700 feet to the existing Eversource ROW. A paved driveway apron is proposed to be constructed at the driveway entrance in accordance with local standards and the travel surface upgraded for Project use by the addition of gravel. A gravel maintenance/parking area would be established on the property adjacent to the main entrance. Short driveways would extend from the existing access road to access the two outlying northern solar fields.

Beginning at the Eversource ROW, approximately 13,500 linear feet of new 15-foot wide internal gravel roads would be constructed to provide centralized access to the solar field, electrical equipment, and stormwater detention basins. To minimize site disturbance, the new roadways would be constructed on prepared subgrades with a 12-inch layer of processed stone and would match existing grades to the greatest extent feasible.

Construction of the Project is expected to begin in Spring of 2019 with completion by the end of 2019. Site mobilization and initial preparation work would occur followed by site grading. Site grading would only occur once the ground has sufficiently thawed, and erosion and sedimentation controls properly installed. The project work schedule would be revised accordingly based on the timing of necessary pre-construction regulatory approvals.

Construction activities are expected to occur Monday through Saturday between the hours of 7:00 a.m. and 9:00 p.m. The Petitioner would consult with the Town to minimize potential impacts of construction vehicles on existing traffic patterns and roadways. The location of the Project site in close proximity to Interstate 95 and Interstate 395 is expected to minimize construction-related traffic effects on local roadways. Once construction is complete and the Project is operational, only maintenance vehicles would periodically access the Project site.

The aisle rows would be 14.5 feet wide, sufficient for mowing and maintenance activities. Project maintenance may include periodic cleaning of the solar modules using water and the replacement of damaged equipment. Spare panels and other equipment would be stored at an off-site location.

### **Public Safety**

The Project would be designed in accordance with the National Electrical Safety Code, Institute of Electrical and Electronics Engineers guidelines and National Fire Protection Association (NFPA) standards. There are no structures, proposed or existing, that could pose a hazard to the facility or the interconnection route. GRE intends to use 2018 NFPA criteria that specify a vegetation management plan for areas under and around the solar arrays in order to balance stormwater management and soil stabilization with fire protection considerations.

Solar array foundations would be secured using driven piles, ground screw foundations or concrete ballasts. All racking would be designed to meet applicable local building codes for wind and snow loading.

Blasting to install facility infrastructure is not anticipated. Bedrock would be removed, as necessary, by mechanical means such as rock chipping.

The nearest airport is approximately 7.5 miles southeast of the site in New London. Because the Project is located more than two miles from the nearest airport, the Federal Aviation Administration does not require an aviation glare analysis.

The facility would be unmanned. It would be remotely monitored using a data acquisition system, allowing for the remote shutdown of the facility during fault conditions or power outage events.

Prior to project operation, the Petitioner would meet with local emergency first responders regarding site access and to provide information regarding emergency response specific to solar facilities. In the event of an emergency, the first responders would have access to the main disconnect switch to cease grid power and de-energize the inverters. Emergency vehicles and service equipment would be able to access interior Project areas using the gravel access roads.

The Project would meet or exceed applicable industry, state, and local codes and standards. All applicable health and safety requirements relevant to solar energy generating facilities would be followed during construction and operation, and the Project would not pose any safety concerns or hazards to the general public.

Construction-related noise is exempt from DEEP Noise Control Standards. Operational noise from the facility would meet DEEP and Town noise standards at the Site property boundaries. The Project is required to meet sound levels of 62 dBA at the nearest industrial property, 55 dBA at the nearest commercial property, levels of 55 dBA at the nearest residential property during the day (when electricity would be generated by the Project), and 45 dBA at the nearest residential property at night (when certain ancillary equipment may still be operating). Most operational noise generated by the Project would be from the transformers and inverters located on each utility pad. Noise modeling indicates that noise levels from this equipment at the property boundaries would be less than 40 dBA, a sound level that is unlikely to be perceptible above the existing noise environment.

## Environmental Effects and Mitigation

### *Historic and Recreational Resources*

GRE reviewed potential Project-related impacts to historic and archeological resources by conducting a Phase IA Cultural Resources Assessment Survey of the site. No historic resources were found on or adjacent to the Site. An archeological assessment concluded that approximately 75 percent of the site consists of areas with no or low archaeological sensitivity with the remaining areas considered as having a moderate or high potential. GRE's consultants recommend a Phase 1B archeological assessment of these areas.

There are no developed recreational resources or open space parcels adjacent to the Site.

### *Visibility*

There are several single-family residences along Oil Mill Road that are located within 1,000 feet of the Project area with the closest residence abutting the Project site entrance on Oil Mill Road. The nearest residence from a solar field perimeter fence is approximately 310 feet to the east from the northwest solar array.

The Project Site is located on an interior lot, surrounded by relatively undeveloped property. Project visibility is not expected from Oil Mill Road or the residences along Oil Mill Road. Although the Project site abuts undeveloped properties, the Town requested that a minimum 50-foot vegetated buffer be maintained between any Project construction areas and any abutting residential property to minimize potential Project visibility in the event the residentially-zoned parcels are developed. GRE would examine vegetative buffers/screening during final site design.

No state designated scenic roads are located within one mile of the Project site. The Project would not be visible from area public hiking trails maintained by the Connecticut Forest and Parks Association.

### *Agriculture*

A review of the USDA's soil mapping for the area indicates that the property does not contain any prime farmland. The site has been forested since at least the 1930's and it is classified under Public Act 490 as woodland forest. Construction of the Project would change this classification. Timber on the parcel is currently being harvested by the landowner and GRE may be able to utilize some of the established logging skid paths during Project construction if the paths are upgraded to meet stormwater control criteria.

### *Wetlands*

Two separate wetlands were identified on-site and have been delineated in the Petition as Wetland 1 and Wetland 2. Wetland 1 (W1) is located in the northwest portion of the parcel and is part of a larger forested wetland that extends off-site. Wetland 2 (W2) is 0.14 acre in size and is located on a rocky, forested slope in the central portion of the parcel near the east property line.

The on-site portions of W1 are separated into several areas, with the largest contiguous area totaling 11.56 acres. This area is located at the head of a small tributary of Oil Mill Brook and extends across the existing Eversource ROW. Two smaller portions of W1 are located in the extreme northwest corner of the site and connect to the main body of W1 off-site. The two isolated on-site portions of W1 total 1.39 acres.

Project construction would have no direct wetland impacts. An existing woods road crossing of W1 would be upgraded to accommodate construction vehicles and post-construction vehicle access. The existing road crossing has been recently modified for use by commercial logging vehicles. Once timber harvesting is completed, the crossing would be restored to its previous condition. GRE would review the condition of the

crossing at this time to determine the condition of the road and a culvert. GRE anticipates Project related crossing upgrades would include side slope stabilization and the creation of a gravel travel surface.

A 100-foot wide no disturbance wetland buffer would be maintained for most of the Project area except for minor selective clearing in certain locations to improve the existing dirt access road. A 50-foot no disturbance buffer has been established for the wetland area near the Eversource ROW due to pre-existing disturbance. GRE would establish a secondary 100-foot buffer to further separate solar arrays or paved/concrete surfaces from adjacent wetland areas.

Three vernal pools were identified on-site, referred to as Vernal Pools 1 through 3. All three vernal pools are cryptic in nature. The vernal pools are small, with shallow hydrology and a somewhat marginal hydroperiod for breeding. All three vernal pools, however, are utilized by vernal pool obligate species.

Vernal Pool 1 is located in the northwest portion of the parcel and within an isolated section of W1. The existing dirt road extending from Oil Mill Road is within the outer edge of the 100-foot vernal pool envelope (VPE) but no expansion of the existing road is necessary. Project construction would increase the on-site developed area of the vernal pool critical terrestrial habitat (CTH) from 0.5 percent to 4.1 percent.

Vernal Pool 2 is located south of the existing access road and along the west property line. No construction would occur within the VPE and there would be a minimal increase (0.4 percent) in the developed portion of the CTH.

Vernal Pool 3 is located on the upslope side of the existing woods road crossing over W1 and likely was created by the installation of this road. No construction would occur within the VPE, with the exception of existing road improvements within the confines of the existing disturbed area. Construction of the solar field would increase the on-site developed portion of the CTH from 1.5 percent to 24.9 percent.

#### *Wildlife*

Two upland habitat types are present on the property; old field (managed utility ROW) and mixed hardwood forest. Old field habitat occurs solely within the Eversource ROW, and totals approximately 5 acres. The remaining 147 acres of the site consists of mixed hardwood forest.

GRE evaluated wildlife impacts by focusing on the 2015 Connecticut Wildlife Action Plan (WAP), which established a framework for proactively conserving Connecticut's fish and wildlife, including their habitats, especially for species of Greatest Conservation Need (GCN). The evaluation focused on those species most likely to be adversely impacted from a change in land use. These include amphibians and reptiles which have low mobility and dispersal capabilities, as well as breeding birds of conservation concern within the State. As part of the assessment, GRE reviewed DEEP's Natural Diversity Database (NDDB) for any records of State-listed species on the Site. No existing NDDB records were found on the Project site.

During Project-related wetland surveys, an Eastern ribbon snake, a state-listed species of special concern, was observed in an early-successional portion of W1 along the existing ROW. The ribbon snake inhabits a variety of shallow water aquatic habitats, favoring open grassy or shrubby areas bordering streams and wooded swamps, making the vegetative composition of the ROW the most suitable habitat for the snake on the site. The proposed wetland buffer in this area, and the lack of Project disturbance within the ROW, would be protective of the primary habitat for the ribbon snake. GRE has submitted a DEEP NDDB report form for the observed snake. Due to the location of the observed ribbon snake on the site and the general lack of construction within this area, GRE's consultant did not recommend protection measures for the snake and does not anticipate DEEP to recommend species protection measures for the Project. W2 provides sub-optimal habitat for the ribbon snake as it is heavily forested and consists of a steep, boulder strewn groundwater discharge zone.

As part of the DEEP required General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities (General Permit) for the Project, GRE is required to obtain a written determination from DEEP that the Project “does not threaten the continued existence of any state or federal species listed as endangered or threatened (“listed species”) or result in the destruction or adverse modification of any habitat associated with such species.”

According to the U.S. Fish & Wildlife Service (USFWS) the range of the northern long-eared bat (NLEB), a federally-listed Threatened Species and a state listed endangered species, encompasses the entire State of Connecticut. However, the Project would not be located within 0.25 mile of a known NLEB hibernaculum or within 150 feet of a known occupied maternity roost tree, and thus, no Project-related adverse impacts to NLEB are anticipated.

During the spring of 2018, timber harvesting on the proposed site commenced, an agricultural activity approved by the Town. Most of the large trees (over 15 inches d.b.h.) are in the process of being removed, leaving the tree canopy open in many areas. DEEP, in its comments of August 20, 2018, stated that although the ongoing logging operations have altered the composition of the existing forest by creating gaps in the overall forest canopy, the harvested area creates valuable habitat and does not diminish the value of the greater core forest that exists partially on the site. Many species of GCN would benefit from the altered forest habitat for many years.

The principal bird species expected to breed on the site property are forest-dwelling birds, including those species requiring forest “interior”, generally defined as forest that is a minimum distance of 300 feet from non-forested areas. These include a number of neotropical migratory songbirds of high conservation priority, both in Connecticut as well as regionally. Development of the Project area would render the site largely uninhabitable for forest-dwelling birds by converting forested areas to solar field areas or to edge forest where interior forest birds would have a much lower breeding success.

The solar panels would not create a glare attractant for birds where the panels would appear as water, creating an impact hazard. Studies in California determined certain bird species have been negatively impacted by concentrated solar facilities, which is a different type of solar power technology than what is proposed for this Project.

Approximately 6 acres of the Project site would be cleared to reduce Project shading but would not be grubbed, allowing these areas to remain in a native shrub state and thus can provide wildlife benefits. To promote this early-successional edge habitat, these areas should be mowed/cleared no more than once per year. All clearing should occur between October 15th and March 1st, to minimize potential impacts to wildlife utilizing the shrub areas.

Site perimeter fencing would be designed with a 6-inch gap between the bottom of the fence and existing grade to allow for the movement of small wildlife across the site. Larger animals, such as deer and bobcat, would be deterred from entering the solar field.

#### *Forest and Parks*

Development of the Project would require the clearing of 97.5 acres of land, mostly consisting of previously harvested forested areas on the property. Approximately 51.4 acres of the site parcel would remain forested, primarily within and adjacent to the wetlands located in the northwest portion of the property.

The existing forest on the property is part of an approximately 750-acre contiguous forest block composed of numerous private properties zoned for industrial and residential development. The forest block is generally located between I-395, I-95, Route 85 and Cross Road.

Contiguous forest blocks have been categorized by the UCONN Center for Land Use Education and Research (CLEAR) into three classes of core forest, as follows: small core forest consists of those forest patches that are smaller than 250 acres, medium core forest patches are between 250 and 500 acres, and large core forest patches are greater than 500 acres. Using CLEAR criteria the existing 750-acre contiguous forest block is classified as a large core forest, providing enough suitable habitat to support a greater diversity of interior forest species than smaller forest blocks.

Development of the Project would result in the fragmentation of the 750-acre forest block into smaller core forest blocks, located primarily on adjacent private property. One forest block would remain to the southwest of the Project area but would be less than 100 acres, and thus would not provide quality habitat to support forest-interior birds. A medium sized core forest block would remain to the east and northeast of the Project area, offering enough habitat to support interior forest birds species.

There are no public parks located on or abutting the Site property.

#### *Air Quality*

Operation of the facility would not produce air emissions of regulated air pollutants or greenhouse gases and therefore no DEEP air permit would be required. During construction of the Project, any construction related air emissions would be temporary and controlled by appropriate mitigation measures. A carbon debt analysis accounting for the loss of forest to develop the site, and the anticipated service life of the facility, indicates net carbon reduction would begin after 69 days of Project operation. Thus, the proposed Project would result in an overall net reduction in carbon dioxide emissions to the environment.

#### *Water Quality*

The project is not located within a DEEP-designated aquifer protection area. Installation of solar array support posts is not expected to have any effect on any nearby water wells that may be present in the area due to the significant distance between solar field areas and developed residential properties. Based on limited soil borings, depth to groundwater varies from surface to 13 feet. Several borings did not encounter groundwater.

The Project is outside of Federal Emergency Management Agency designated 100-year and 500-year flood zones. The site is outside of the DEEP-designated coastal boundary.

Both the Town and DEEP noted that the Project is in the Niantic River watershed. The site contains a segment of Oil Mill Brook, along with wetlands that drain directly to both Oil Mill Brook and Stony Brook, streams that are tributaries to the Niantic River, a tidal waterway draining to Long Island Sound.

Based on watershed mapping, 31 acres of the Site property are within the Stony Brook watershed and 50+ acres are within the Oil Mill Brook watershed. Both watercourses are high quality, cold water fisheries that support native trout. In 2006, DEEP approved a watershed-based plan in order to improve water quality within the Niantic River. The Town and DEEP have expressed concern regarding potential degradation of the water quality in both tributaries that could be caused by the development of the Project site if appropriate stormwater controls are not designed properly or implemented. The Project would result in less pollutant loading to the Niantic River watershed when compared to its potential development as residential, per its zoning designation.

During construction, GRE would utilize fiber rolls/silt socks upgradient of wetland areas. Restoration of the site within the limits of disturbance would include new low maintenance ground cover within the solar array field and adjacent perimeter fence area. Establishing vegetative cover would stabilize the soil and reduce stormwater runoff.

Post-construction water quality enhancement measures include establishing grassed-lined swales with rock check dams to reduce water velocity, installing detention basins within each site drainage area, locating stormwater detention basins a minimum distance of 100-feet from wetland resources and maintaining a 50-foot to 100-foot wide natural buffer between developed areas and existing wetlands. Cleared areas between the solar field perimeter fence and the wetland setback line would be seeded with a mix of native low-lying plants, shrubs, and groundcover.

Non-point source pollutant loading from the site would be minimized by not using chemicals at the site, establishing of vegetation in disturbed areas using appropriate seed mixes, and control of sediment by directing water into swales and detention basins.

In addition to these protective measures, a DEEP General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities (General Permit) would be required to ensure there are no impacts to on-site and off-site water quality. GRE would develop a Storm Water Pollution Control Plan (SWPCP) for DEEP review and approval that would maintain predevelopment drainage patterns and flows to the greatest extent feasible, and thus, not degrading off-site water quality.

### **Stormwater**

Development of the Project would disturb over one acre of land and therefore would require registration for a DEEP General Permit. The General Permit requires developers and builders to design and implement a Project-specific SWPCP to prevent the movement of sediments off of construction sites into nearby water bodies and to address the impacts of stormwater discharges from a project after construction is complete.

Although the Town and DEEP have both expressed concerns regarding stormwater management and degradation of off-site water quality and watersheds in their respective comments to the Council, all aspects of stormwater management at the site is under the exclusive jurisdiction of DEEP's Water Permitting and Enforcement Division.

GRE met with representatives from DEEP's Water Permitting and Enforcement Division on May 2, 2018. At the meeting, it was determined that in order for the Project solar arrays to be considered pervious, in accordance with row spacing design parameters established in the State of Minnesota's Stormwater Manual, which DEEP is currently using for guidance in analyzing stormwater management for solar farms, a minimum panel row width of 14.5 feet is necessary. Other stormwater control measures used in the Minnesota Stormwater Manual and employed by DEEP to determine if a project can be considered pervious includes maintaining site conditions to allow for sheet flow and deploying engineered practices such as, but not limited to, level spreaders, terraces or berms on slopes greater than 5 percent to ensure long term sheet flow conditions, and that solar arrays be constructed in a way that allows for the growth of vegetation between and beneath the panels. The Project, as designed, will meet the aisle row spacing, sheet flow control and vegetative growth as set forth in the Minnesota Stormwater Manual and as adopted by DEEP. The proposed Project roadways would also be considered pervious.

All aspects of Project construction phasing, erosion and sedimentation control methods, temporary and permanent stormwater control features, and on-site monitoring and reporting requirements are reviewed and approved by DEEP as part of the General Permit registration. No site construction activities can occur until the General Permit is issued. DEEP has the authority to enforce compliance with the SWPCP.

The SWPCP requires appropriate construction phasing and the establishment of erosion control features in accordance with the 2002 *Connecticut Guidelines for Soil Erosion and Sediment Control* and the 2004 *Connecticut Stormwater Quality Manual*. In its August 20, 2018 correspondence to the Council, DEEP attached a document entitled *Stormwater Management at Solar Farm Construction Projects, September 8, 2017* that provides guidance to solar farm project developers for permit registration and SWPCP preparation.

GRE has included an initial Stormwater Management Report in the Petition that used DEEP General Permit criteria to examine the hydrological response of the proposed post-construction site layout to determine what stormwater control features are necessary that would mimic existing pre-construction drainage conditions as much as possible. The preliminary Project stormwater design was based on initial geotechnical work and includes 13 stormwater detention basins located throughout the Project site, mostly located along the perimeter of the Project area. The stormwater management plan may need to be altered based on additional geo-technical work at the site before it is submitted to DEEP for final approval.

The initial stormwater management design allows stormwater runoff to sheet flow across the surface before being intercepted by existing drainage swales created by natural topography and/or by proposed grass-lined drainage swales. Where conditions allow, historical flows patterns and discharges would be maintained. In areas where site improvements have altered natural drainage patterns, runoff would be directed towards a detention basin or allowed to free release off-site. If the free released flows did not match historical conditions in that area, site drainage area detention basins would collect and control off-site flows.

Level spreaders are proposed upgradient of sensitive areas such as wetlands and vernal pools and are designed to dissipate stormwater discharge that would mimic existing flow conditions, as opposed to point discharge which concentrate flows. In combination with the proposed level spreaders, each outfall would be installed to maximize stormwater travel time from the detention pond to any sensitive areas receiving runoff. The detention basins would also be designed as “dry ponds” so that water is not held for extend periods of time and subject to dramatic increases in temperature prior to release.

A preliminary construction sedimentation and erosion control plan has been developed. The plan includes constructing the project in 13 phases with each phase having provisions for runoff control including, but not limited to, sedimentation basins and erosion control fencing. The plan also includes provisions for regular inspection of erosion control measures to prevent sedimentation or water quality impacts on and off-site.

### **Decommissioning Plan**

The Project has a minimum 35 year design life. At the end of its useful life, the Project would be decommissioned in accordance with the requirements of the Property lease and a decommissioning plan. All equipment, including racking systems, panels, inverters, ballast foundations, and electrical systems, would be removed in accordance with the Project’s Decommissioning and Restoration Plan. Security fencing and roadways may remain if directed by the landowner. The overhead interconnection to the utility power grid would be removed unless the landowner determines that the electrical service line would be beneficial for future use of the site. Once equipment is removed, the ground surface would be repaired and re-vegetated, as necessary. Overall site rehabilitation and reseeded activities would depend on the subsequent use of the Project Site.

### **Conclusion**

The Project is a distributed energy resource with a capacity of not more than sixty-five megawatts, and would meet DEEP air and water quality standards contingent upon GRE obtaining a General Permit, and furthermore, would not have a substantial adverse environmental effect.

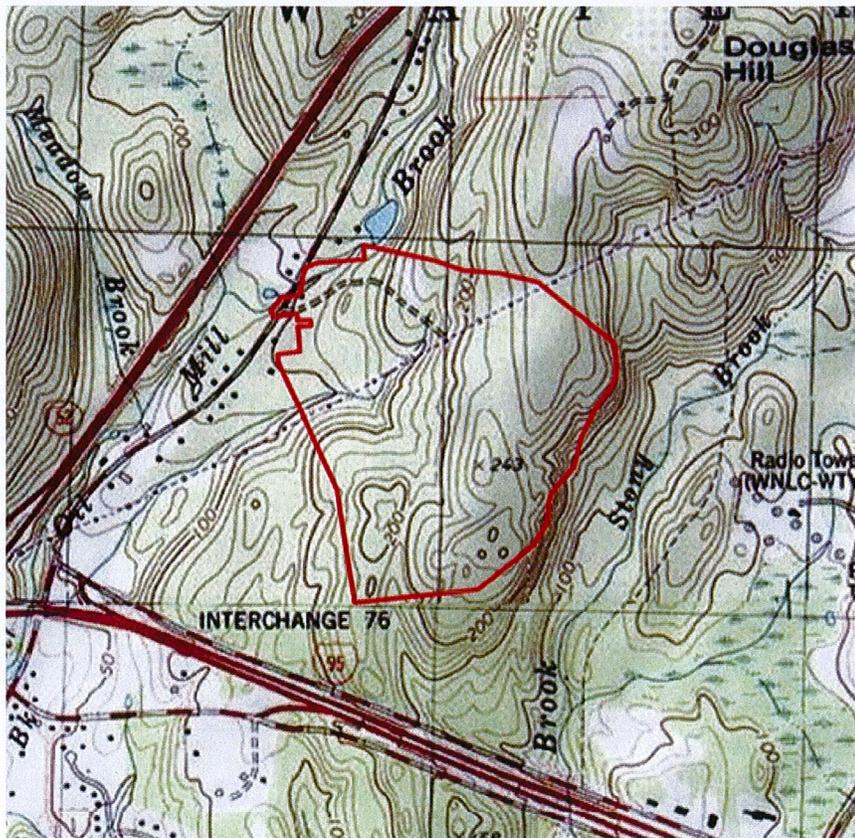
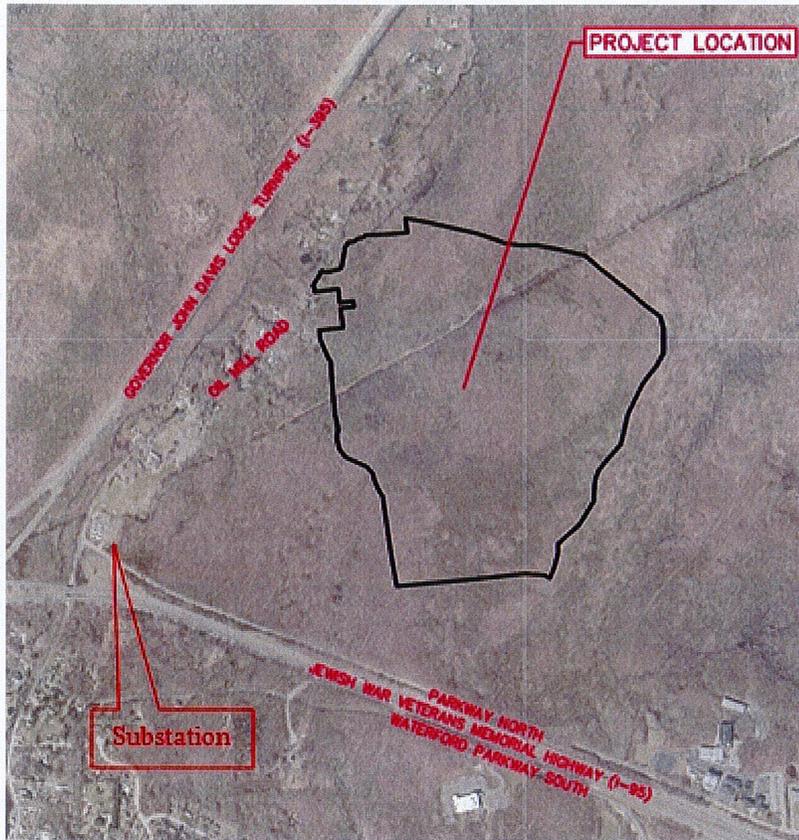
The proposed Project will not produce air emissions, will not utilize water to produce electricity, is designed to minimize and mitigate environmental impacts, and furthers the State's energy policy by developing and utilizing renewable energy resources and distributed energy resources.

### **Recommended Condition**

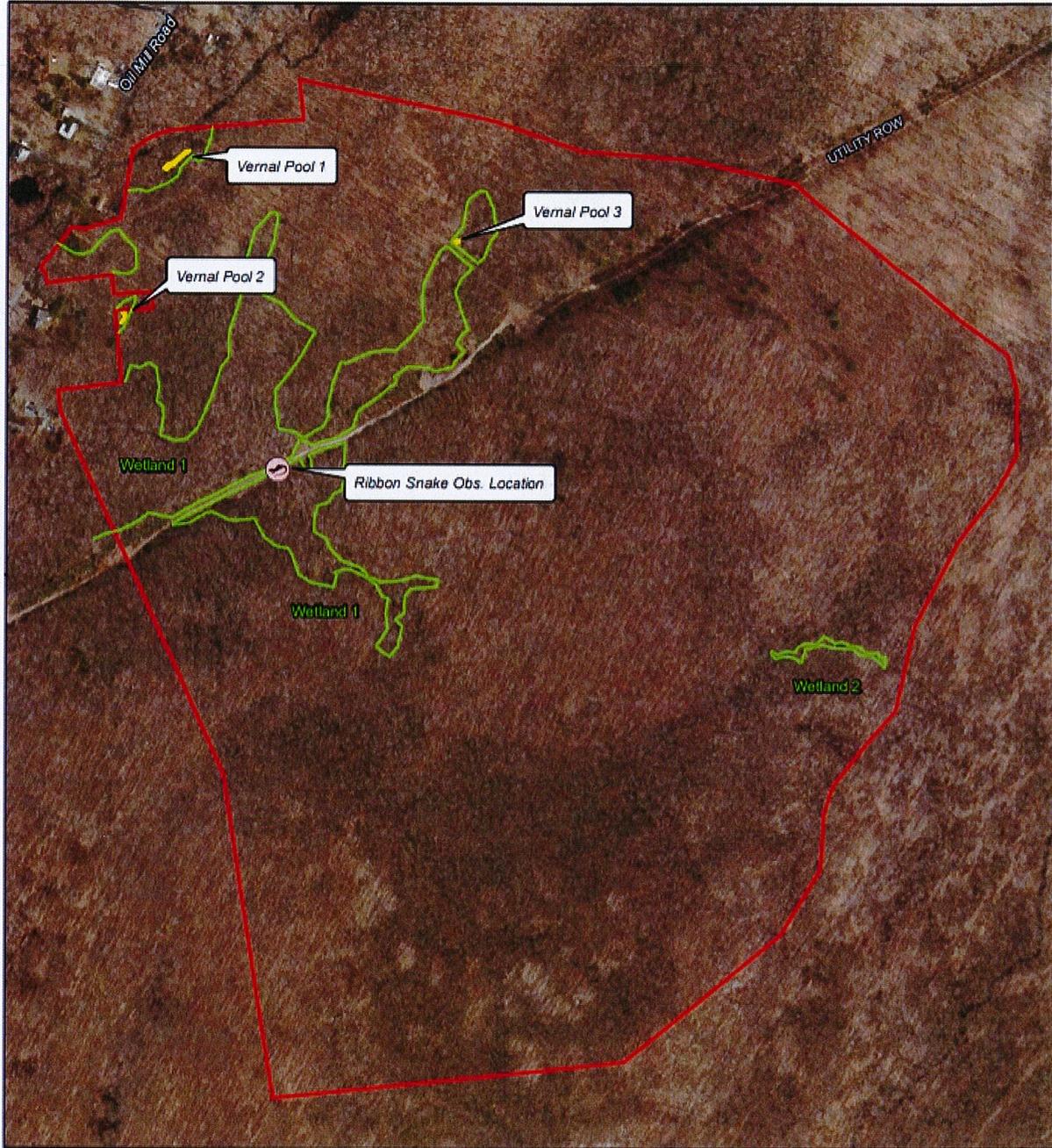
Staff recommends inclusion of the following condition;

1. The Petitioner shall prepare a Development and Management Plan (D&M) for this facility in compliance with Sections 16-50j-60 through 16-50j-62 of the Regulations of Connecticut State Agencies. The D&M Plan shall be served on the Town of Waterford for comment and submitted to and approved by the Council prior to the commencement of facility construction and shall include:
  - a) A final site plan including, but not limited to, final solar panel and racking system design, access roads, electrical interconnection, fencing, equipment pads, and post-construction stormwater controls, as designed in the Department of Energy and Environmental Protection (DEEP)-approved Stormwater Pollution Control Plan (SWPCP);
  - b) Submission of a copy of the DEEP-approved SWPCP;
  - c) Construction site plans that comply with the DEEP-approved SWPCP that include, but not limited to, site clearing, grading, site phasing, construction laydown areas, temporary access roads, erosion and sedimentation controls, concrete washout stations, and specifics on construction related environmental mitigation;
  - d) Final seeding plan and landscaping plan;
  - e) Details of any pre and post-construction environmental mitigation measures; and
  - f) Details of post-construction site maintenance and vegetation management.

Site Location Maps



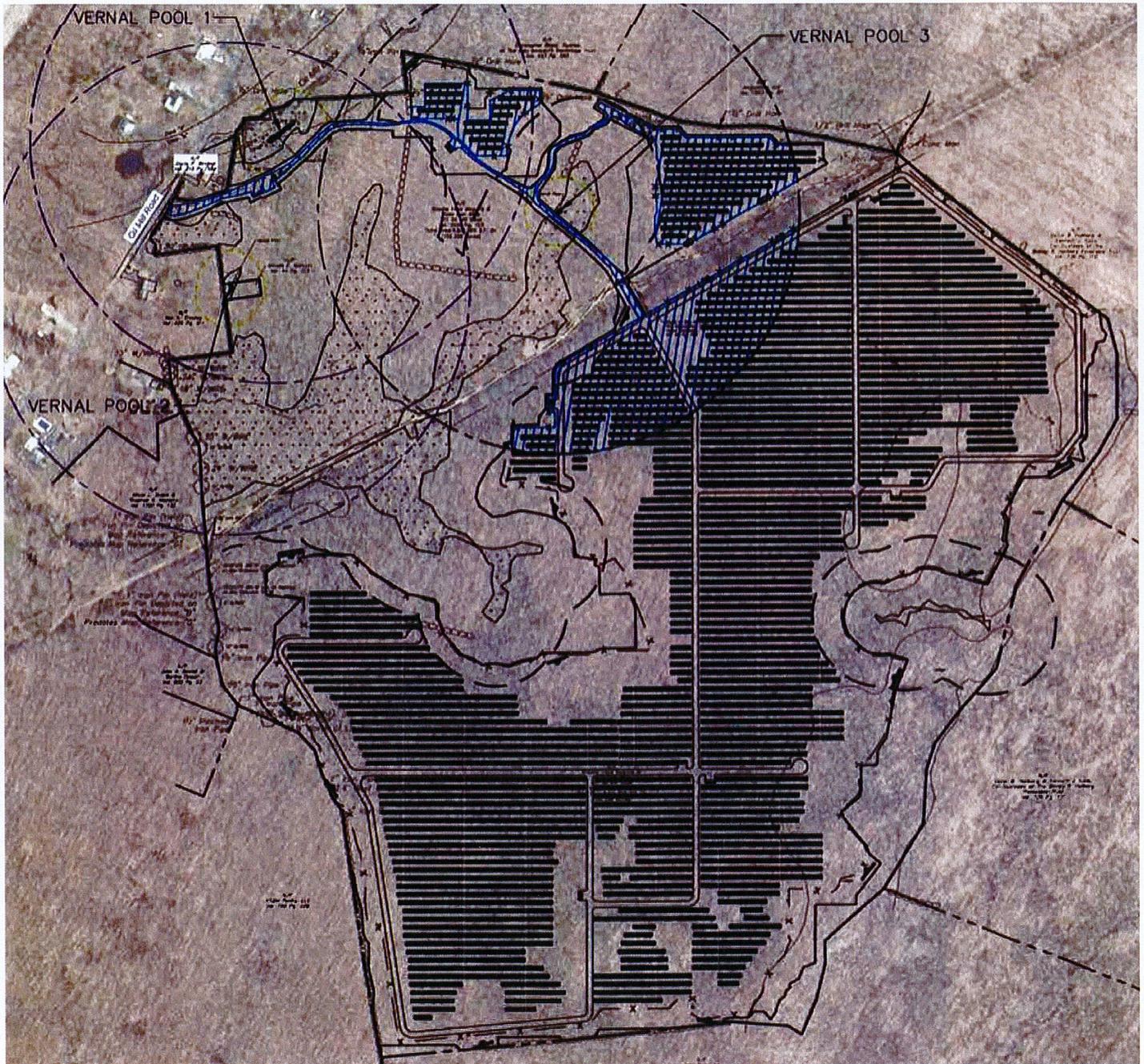
### Wetland Map



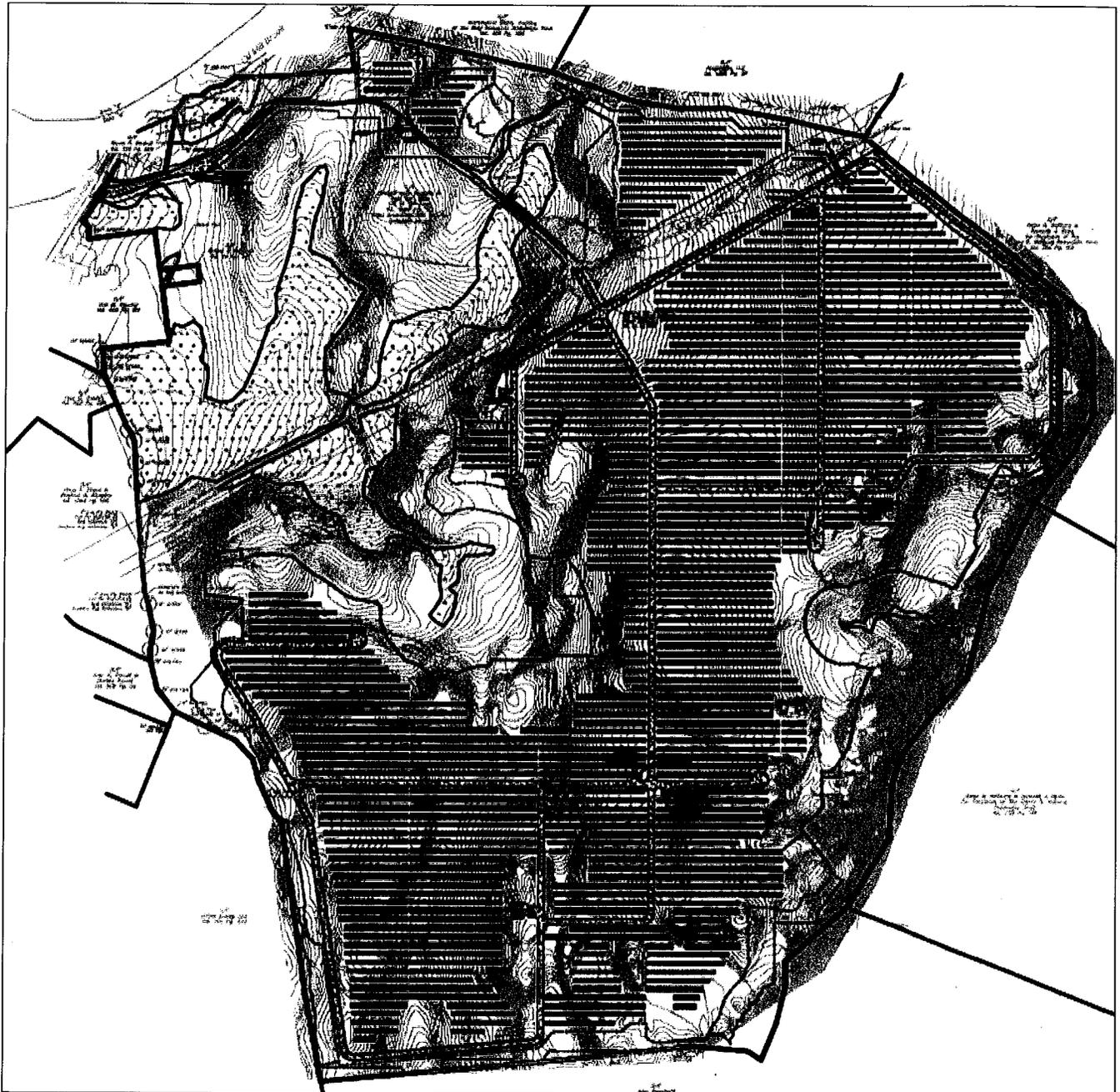
<b>Legend</b>	
	Parcel Boundary
	Vernal Pool
	wetland boundary

<b>SCALE</b>		
0	212.5	425 Feet
		

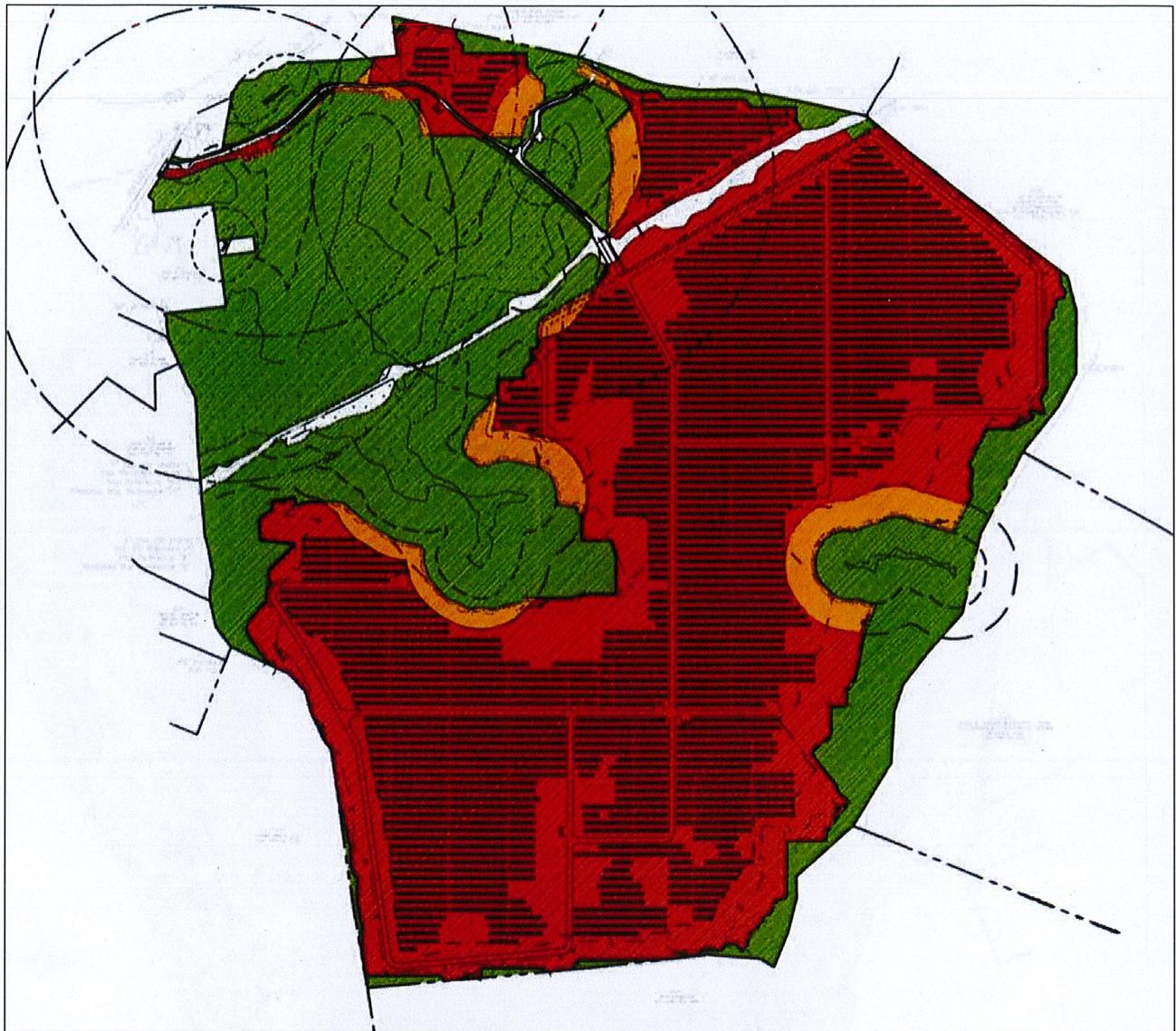
### Proposed Site Layout- Aerial Photograph



### Proposed Site Layout- Terrain Map

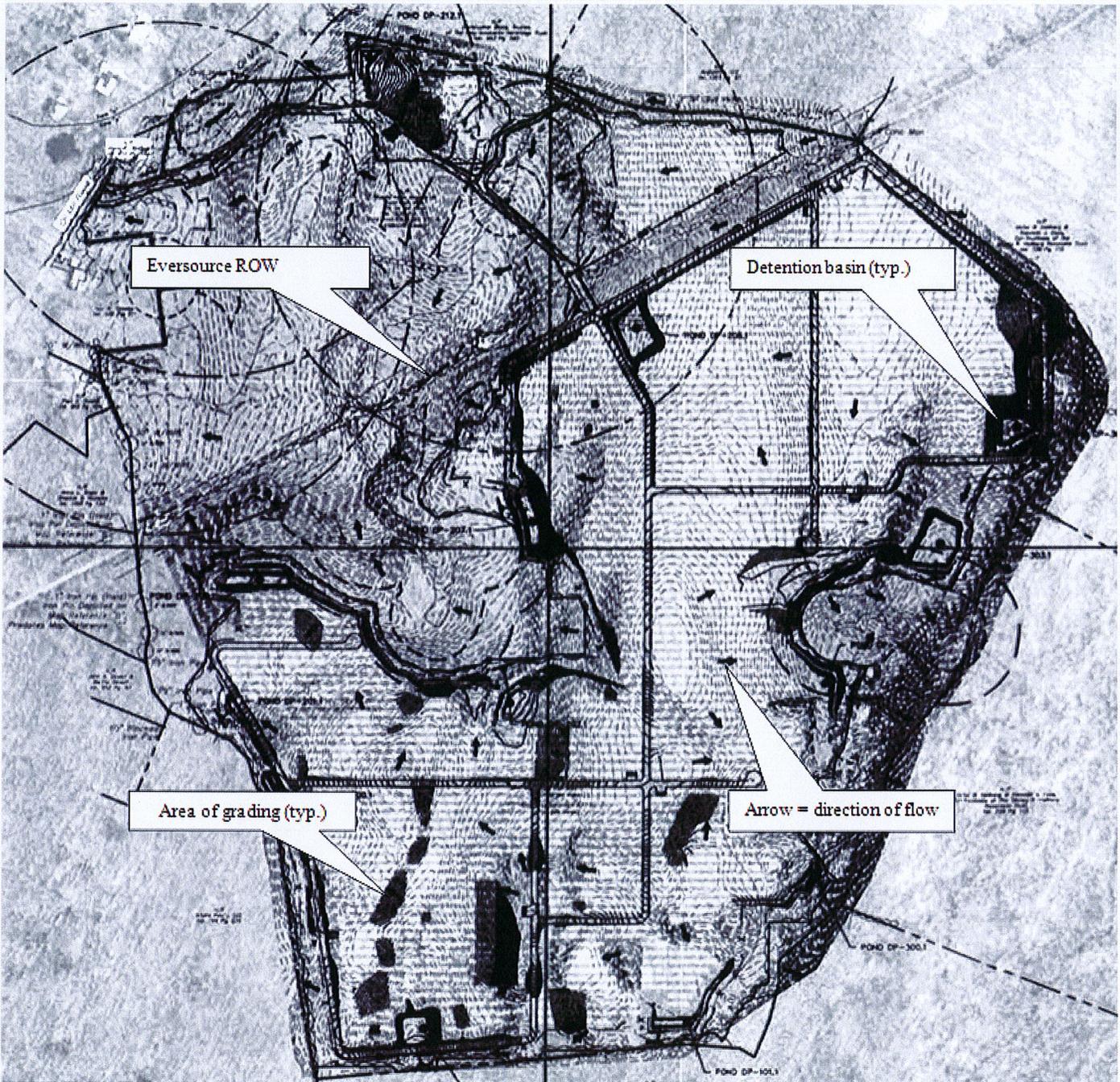


### Proposed Clearing and Grubbing Plan



	TREES TO BE REMOVED (81.36 ACRES)
	STUMPS TO REMAIN (8.13 ACRES)
	TREES TO REMAIN (81.43 ACRES)

### Preliminary Site Grading and Stormwater Flow Plan

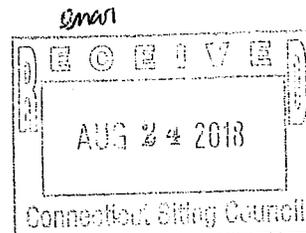


# **ATTACHMENT**

DEEP Comments to Council, dated August 20, 2018

August 20, 2018

Robert Stein, Chairman  
Connecticut Siting Council  
10 Franklin Square  
New Britain, Connecticut 06051



RE: 16.78 MW Solar Photovoltaic Electric Generation Facility  
GRE GACRUX LLC  
117 Oil Mill Rd, Waterford CT 06385  
Petition No. 1347

Dear Chairman Stein:

The Department of Energy & Environmental Protection (DEEP) has reviewed the above referenced *Petition for Declaratory Ruling* for the installation and operation of a 16.78 megawatt AC ground-mounted solar photovoltaic electric generating facility and offers the following comments for your consideration.

GRE GACRUX LLC submitted this 16.78 MW project into the Small Scale Clean Energy Request for Proposals (RFP) issued by DEEP. Connecticut solicited and selected renewable energy projects pursuant to Section 1(b) of Connecticut Public Act 15-107, *An Act Concerning Affordable and Reliable Energy* (P.A. 15-107) and Sections 6 and 7 of Connecticut Public Act 13-303, *An Act Concerning Connecticut's Clean Energy Goals* (P.A. 13-303). Bringing grid-scale renewable energy projects on line is an important step forward towards a cheaper, cleaner, and more reliable energy future for the ratepayers of Connecticut. In the most recent legislative session, Connecticut committed to procuring 40% of its electricity from Class I renewable sources by 2030. Connecticut also committed to a mid-point reduction of carbon emissions of 45% below 2001 levels by 2035 on the way to attaining the state's longer term goal of an emissions reduction of 80% below 2001 levels by 2050. Grid scale renewable energy projects are essential to maintaining compliance with these statutory commitments. After reviewing all the projects submitted through the RFP process, DEEP selected the GRE GACRUX LLC project as one of the projects authorized to negotiate a long-term power purchase agreement with the utilities, Eversource Energy and The United Illuminating Company.

**Site Visit**

Field reviews of the site were conducted on June 29, 2018 and July 25, 2018. The parcel is an interior lot accessed by a dirt/gravel road off of Oil Mill Road. The zone for this area is rural residential, RU-120. The property consists of one parcel totaling 152.23 acres. Approximately

90 acres will be utilized for the project. At the time of the site visit a forest harvest was being conducted by the landowner. A plan for the harvest was submitted to the Town of Waterford by a Forester or Supervising Forest Harvester in January 2018 and accepted by the municipality. The Town of Waterford is monitoring the site for wetland impacts and wetland crossings.

The parcels contains wetlands, large bedrock outcrops and steep slopes. During the site visits, DEEP noted the steep topography, which ranges from approximately 100 feet to 250 feet. Discussions with the consultant for the proposed project during the site visit revealed that only cursory soils and geotechnical surveys were conducted, and further borings would be needed to determine constructability of the proposed stormwater detention basins.

### **Stormwater Management**

Construction-related land disturbances of 0.5 acres or larger are regulated in Connecticut pursuant to the Connecticut Soil Erosion and Sediment Control Act under Sections 22a-325 to 22a-329, inclusive, of the Connecticut General Statutes (CGS). Construction-related land disturbances of one (1) acre or larger are also regulated under CGS Section 22a-430 and under Section 402(p) of the federal Clean Water Act and the National Pollutant Discharge Elimination System (NPDES) program. Construction projects involving five (5) or more acres of land disturbance require an individual NPDES discharge permit from DEEP, or may be eligible to register for coverage under DEEP's NPDES General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities (general permit). DEEP has issued guidance for construction of solar farms for stormwater management dated September 8, 2017 (attached).

Approximately 90 acres of the site will be cleared for development, which involves clear cutting, grubbing, grading, top soil removal and replacement. Construction is anticipated to take 12 months beginning in spring 2019. The site is proposed to be constructed in 13 phases. The application states that hydroseeding will be done to stabilize each phase, however it does not state what methods will be used during winter, frozen ground conditions or during spring thaw. Given the compressed construction schedule, and that the site is proposed to be constructed in 13 phases, the timeframe does not allow for sufficient site stabilization in between each phase. DEEP has experienced adverse water quality impacts with three recent solar projects due to this type of aggressive construction schedule not allowing for adequate site stabilization and non-compliance with stormwater pollution control plans and other NPDES stormwater permit requirements, which resulted in the issuance of Cease and Desist Orders to those entities. DEEP strongly advises planning for a longer construction schedule to appropriately address each phase with stormwater controls and stabilization methods, and provide time for prompt implementation of corrective actions if needed. Also, since a forest harvest was being conducted by the landowner prior to development, should significant soil disturbance occur as a result of the harvest, DEEP may require site stabilization to be established prior to authorizing the commencement of any construction activities at the site. Such soil disturbances can reasonably be expected to increase soil erosion and sedimentation on and off the site prior to construction. As a component of the permitting process, DEEP may require the applicant to hire an independent third party to oversee and verify compliance with stormwater management requirements during construction.

### **Stormwater Discharge and Infiltration**

In post-construction conditions, smooth surfaces are created through grading and vegetation that were not present in pre-construction conditions, in which there are rocks, depressions and a

variety of vegetation, roots and soils. Those types of pre-construction characteristics can trap, slow down and infiltrate runoff. On the contrary, in post-construction conditions, the smoothed surfaces can increase velocity on the sloped areas of this site. The petition should address potential measures to mimic pre-construction conditions in order to slow water down and allow for infiltration to control stormwater discharge peak flowrates and velocity and total stormwater volume. The petitioner needs to ensure the design factors smooth surfaces, compacted soils, soil types, slopes and bedrock into the calculations for pre-construction, during construction and post-construction design flows, velocities and volume. Also, a detailed geotechnical study of the site should be completed to verify constructability and size of the drainage basins and level spreaders indicated on the site plans.

In addition, removing topsoil from the site creates a loss in organic matter required for plant growth necessary for long term site stabilization. If the topsoil is not replaced or is mixed with subsoil, full vegetation may not occur in a year and could take a few years to stabilize. The applicant should address long term stabilization and site monitoring to fix bare patches by adding topsoil or re-seeding hard to grow areas.

Finally, a road network is proposed along the perimeter on rock outcrops, ledge and steep drop offs. Water runoff on this site will be changing from land overflow to point discharge. Detention basins are proposed along the perimeter to account for the runoff and allow sheet flow with the use of level spreaders. However, these level spreaders are on the property line. The site plans do not show the topography or location of the receiving waters for these level spreaders, and there are no notes indicating how these areas off site will be restored if erosion and sedimentation controls were to fail. Permission may be required from neighboring property owners to allow concentrated discharge onto their property.

### **Watershed**

The petition lacks recognition of the current hydrologic connections of this proposed development site to the shared watersheds of Stony Brook and Oil Mill Brook, or to their individual water quality assessments. This watershed contains a high water quality stream system as supported by over ten years of water quality data from DEEP, the U.S. Geological Survey, the local Niantic River Watershed Committee, as well as stream macroinvertebrate data, and recent cold and cool water fisheries population and habitat evaluations. The Petition documents do not appear to sufficiently evaluate the proposed stormwater management systems for potential thermal and sediment impacts to downstream aquatic resources or describe any measures to mitigate any such potential adverse water quality impacts.

A DEEP approved watershed-based plan was developed for the full Niantic River watershed in 2006 (Niantic River Watershed Plan), followed by a Guided Summary in 2009. Oil Mill Brook and Stony Brook each are currently assessed as Fully Supporting for Aquatic Life use designation, and a pending 2018 assessment should be available in early fall 2018. Stony Brook and Oil Mill Brook are two of the three main freshwater tributaries that feed into the Niantic River estuary and are classified as Class A waters which have the potential to meet the criteria for drinking water as well as provide fish and wildlife habitat. Stony Brook and Oil Mill Brook are estimated to provide one third of the annual nitrogen load from surface fresh waters entering the nutrient-over enriched estuary. The Niantic River estuary is a DEEP priority coastal embayment for watershed restoration action planning by 2022. A tremendous amount of research, data collection and synthesis into nutrient loading and cycling within the Niantic River

watershed and the estuary connections with Long Island Sound is well documented and is currently supporting the development of that DEEP action plan.

The Niantic River does not currently meet water quality standards because of high levels of indicator bacteria and observed degradation of aquatic life. The *List of Impaired Waters* states that the water quality of the Niantic River is not supporting the aquatic life known to inhabit the estuary. The ecological changes are thought to be caused by excessive nutrients entering the river. Stormwater runoff transports pollutants off land into the many tributaries feeding the Niantic River. Polluted runoff is the greatest water quality management challenge for the Niantic River watershed and it is the most manageable of all potential sources of pollution to the river. One of the key findings in this study was the number of storm sewer outfalls directly discharging untreated water into the Niantic River. Though the location of this project is upstream of the River, it is adjacent to the Stony Brook and Oil Mill Brook tributaries. The site plans provided do not show the topography or location of the receiving waters in the various discharge points along the site. In addition, there is not an opportunity for infiltration in the plans. Stormwater management should be designed so there is not an increase in total volume of water or pollutants leaving the site. Erosion and sedimentation controls should be a priority at this location. Effectively managing nonpoint sources relies on land use management and efficiency of stormwater practices.

#### **Wetlands**

In the Wetland and Biological Assessment Report submitted by the applicant, the soil scientists indicate that the wetlands identified as 1 and 2 are hillside groundwater slope wetlands. These wetlands develop on hillsides where groundwater discharges to the surface as springs and seeps. The soil scientists noted that the seeps are visible in the upland/wetland interface, and that a key feature for water quality is the pronounced bedrock and boulder outcrops where cold, well-oxygenated groundwater discharges from fractures in bedrock. Before upland activities take place such as breaking up the rock outcrops for grading and leveling for construction, the effect on wetland hydrology must be addressed.

#### **Wildlife**

This site does not fall in an existing Natural Diversity Database area, but it is likely this location has never been surveyed. The location of the special concern species, the Eastern ribbon snake, and the biological assessment have been furnished to DEEP's Wildlife Division. The wildlife assessment was generally based on habitat with a focus on vernal pools and not on detailed surveys which may have identified state listed plants, presence/absence of bats or other animals, and state listed insects in the area. Breeding bird surveys were not conducted, though avian species were observed when the biologists were at the site. Given the lack of available information, it is recommended that a comprehensive wildlife survey be conducted at the site.

#### **Core Forest**

State of Connecticut Public Act 17-218, requires DEEP and the Siting Council to consider the impact of certain proposed energy-related projects on the environment, prime farmland or forest land, or agriculture, before allowing them to proceed. The Act's requirements for solar facilities do not apply to facilities that DEEP selected in solicitations issued before July 1, 2017. While this project is exempt from requiring a letter from DEEP that the project will not materially affect the land's status as core forest, impacts to core forest should be addressed in the petition. Core forest is defined as unfragmented forest land that is at least 300 feet from the boundary between forest land and non-forest land, as determined by the DEEP commissioner.

This proposed project site is 150 acres of undeveloped land. The interior area of this parcel would be defined as core forest using the 300 feet from a non-forested area. Land surrounding this parcel is currently undeveloped forestland zoned as General Industrial and Rural Residential 120. As previously noted in the Site Visit section above, at the time of the site visit, a forest harvest was being conducted by the landowner. A harvested area creates valuable habitat and does not diminish the value of the greater core forest. By creating such early succession habitat, many species of Greatest Conservation Need will benefit for more than fifteen years.

**Errata:**

1. Several site plan sheets are missing from the application's grading and site utilities sections (G4, SU 4,7,8,9,11,12).
2. The Landscape notes on page LL-17 of site plans follow typical seeding and planting plans that may not apply to a solar application. For example several of the notes refer to the planting and staking of evergreen and deciduous trees. The applicant should clarify if trees are scheduled to be re-planted on the site without potentially shading panels.
3. The Site Work, General Notes section (GN-1) states the agent from the Town of Waterford is responsible for marking the clearing limits. The Town of Waterford does not have jurisdiction over this project. The applicant and contractors are the responsible parties. While these notes could apply to a variety of construction projects, they should be revised to the specific construction for solar projects. There is no mention of the use of a tackifier or erosion control blankets with site stabilization methods, and note #32 on how the wetlands are marked in the field is incomplete.
4. Cover page, Volume 1, states Watertown instead of Waterford
5. Cover page for Appendix E is the Stormwater System Operation and Maintenance Plan, but the plan is labeled as Appendix F.
6. Appendix F states water quality volume and release rates have been omitted from this report due to lack of impervious surfaces. This requires further explanation due to the rock/ledge on site, existing gravel roads and proposed improved gravel roads, as well as creating smooth surfaces in post-construction, and accounting for soil compaction during construction.

Thank you for the opportunity to review this project. If there are any questions regarding these comments, please contact me at 860-424-3739 or [Linda.Brunza@ct.gov](mailto:Linda.Brunza@ct.gov) if there are any questions.

Respectfully yours,

*Linda Brunza*

Linda Brunza  
Environmental Analyst

**Cc: Robert Klee, Commissioner**

## **Stormwater Management at Solar Farm Construction Projects September 8, 2017**

Solar farms are on-the-ground installations of arrays of photovoltaic cell panels, supporting structures and related equipment for the production of electricity. As with other types of construction projects, the construction of solar farms can involve land clearing, grading, excavation, trenching, dewatering and similar activities that create land disturbances which potentially result in soil erosion and sediment discharges polluting wetlands, streams and other surface waters. Construction-related land disturbances of 0.5 acres or larger are regulated in Connecticut pursuant to the Connecticut Soil Erosion and Sediment Control Act under Sections 22a-325 to 22a-329, inclusive, of the Connecticut General Statutes (“CGS”). Construction-related land disturbances of one (1) acre or larger are also regulated under CGS Section 22a-430 and under Section 402(p) of the federal Clean Water Act and the National Pollutant Discharge Elimination System (“NPDES”) program. Prior to the start of such regulated activities, authorization is required from local authorities and, for larger projects, the Connecticut Department of Energy and Environmental Protection (“Department”). Construction projects involving five (5) or more acres of land disturbance require an individual NPDES discharge permit from the Department, or may be eligible to register for coverage under the Department’s NPDES General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities (general permit).

The Department has encountered repeated problems associated with solar farm construction projects covered under the general permit, from the registration process through construction activities. Although in no way an exhaustive list, the following are common problems associated with solar farm general permit registration applications and ways to address such problems:

- Applicants have been submitting registration applications that lack the requisite information or the requirements necessary for authorization under the general permit. The Department requires a complete and sufficient application when a registration application is filed, and may reject any registration application it deems to be incomplete or insufficient.
- Applicants are not adhering to the sixty (60) day/ninety (90) day time frame for Department review as required by Section 3(c) of the general permit. While the Department has on occasion shortened the review timeframe, Applicants are expected to allocate no less than the requisite time frame for the registration application review process and must plan accordingly.
- Registration applications for solar farm projects often fail to identify the project’s contractor and sub-contractors. Section 5(b)(1)(viii) of the general permit mandates that this information be included in the registration application.

- Applicants have been repackaging the Siting Council submittal, which is not acceptable. Section 3(c)(2)(D) of the general permit mandates that the application submittal include only materials required to support the Stormwater Pollution Control Plan (“SWPCP”). This information must be up-to-date and accurate. Any superfluous information delays the registration application review process.
- SWPCPs for solar farm projects are often lacking sufficient detail and information. 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.
- The Applicant’s design professional must be well-versed in the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control (“E&S Guidelines”), specifically the techniques found in Chapter 4, Large Construction Sites, the 2004 Connecticut Stormwater Quality Manual, as well as *current* best management practices (BMPs) recognized by the International Erosion Control Association (IECA), provided such BMPs are equal to or better than the E&S Guidelines.
- From the Department’s perspective, an approvable SWPCP will include methods for avoiding compaction of soils, disconnection and reduction of runoff associated with solar panel arrays, avoidance of concentration of stormwater, and other measures necessary to maintain or improve pre-construction hydrologic conditions.
- Applicants need to follow the SWPCP review checklist when preparing the SWPCP, giving specific attention to post-construction stormwater controls and the development of a detailed long-term maintenance plan to ensure that the SWPCP meets the terms and conditions of the general permit.

Subsequent to authorization for coverage under the general permit, the Registrant is responsible for ensuring compliance with all terms and conditions of the general permit and the approved SWPCP once construction has been initiated. However, for solar farm projects, Registrants often fail to comply with the terms and conditions of the general permit, including the approved SWPCP. In particular, Department staff have observed the following issues that a routine inspection protocol and proper oversight, as required under the general permit, would have prevented, including but not limited to:

- pre-construction site planning and management deficiencies (e.g., existing vegetation, scheduling, training, phasing/sequencing, tree protection, etc.)
- ineffective placement, maintenance, and/or repair of administrative/procedural, vegetative, and structural BMPs (e.g., erosion, sediment and stormwater runoff controls, good housekeeping, materials management, and training)
- lack of thorough inspections
- ineffective or untimely corrective action
- ineffective stabilization practices
- ineffective permanent post-construction controls (i.e., store, treat and direct stormwater quality and quantity to pre-construction levels)

Such issues at solar farm construction projects raise concerns, since such projects often create areas of land disruption larger than the generally accepted BMPs of five (5) acres anticipated under the general permit. As a result, any applicant seeking coverage under the general permit

for a solar farm construction project should take care to address the issues noted above. While by no means exclusive, some recommendations that should be incorporated into a SWPCP to address these issues include:

- Ensuring that only a Professional Engineer and/or Landscape Architect, as defined in Section 2 of the general permit, who meets the qualifications described in Section 5(b)(4)(A)(ii) and who has been approved in writing by the Commissioner, serve as the Commissioner's agent to inspect the site and also serve as the qualified inspector for the purposes of Section 5(b)(4) of the general permit ("authorized professional"). Such authorized professional must remain in good standing with the Connecticut Department of Consumer Protection and be technically and ethically qualified to inspect the site and be retained for the duration of the construction project until the Notice of Termination acceptable to the Commissioner has been filed as described below.
- Ensuring that the authorized professional prepare a proposed inspection checklist to assure the construction project is being conducted in compliance with the terms and conditions of the general permit, and the approved SWPCP is implemented in accordance with the general permit. The inspection checklist shall comply with Section 5(b)(4)(B)(iii) of the general permit, and include a space for the authorized professional's signature and professional stamp.
- Ensuring that the credentials for the authorized professional proposed by the Applicant and the proposed inspection checklist prepared by such authorized professional be submitted for the review and approval of the Commissioner and be included with the registration application for the general permit. No other professional may serve as the authorized professional without the prior submittal of relevant credentials and inspection checklist for the Commissioner's review and written approval.
- Ensuring that the authorized professional personally perform all pre-construction, construction, and post-construction site inspections; perform inspections at the end of any storm event whether or not such storm generates a discharge; and prepare and submit all inspection reports including the supporting inspection checklists in compliance with Sections 5(b)(4)(A) and 5(b)(4)(B) of the general permit.
- Ensuring that the authorized professional report any violations of the terms and conditions of the general permit or the SWPCP to the Commissioner's designee within two (2) hours of becoming aware of such violation, or at the start of the next business day of becoming aware of such violation outside normal business hours and shall, within five (5) days, prepare and submit a signed and stamped written report, which documents the cause of the violation, duration including dates and times, and corrective action taken or planned to prevent future occurrences.
- Ensuring that if circumstances necessitate a revision to the SWPCP, the authorized professional works with the Permittee's design professional to ensure compliance with the terms and conditions of the general permit, and any such change to the SWPCP shall be submitted for the review and written approval of the Commissioner.
- Ensure that the authorized professional reviews all stormwater monitoring reports to evaluate the effectiveness of the SWPCP and to document any adverse impacts that any stormwater controls on the construction site or discharges from the construction site may have on wetlands, streams, any other receiving waterbodies. Such evaluation shall be documented in the inspection reports and inspection checklists performed pursuant to Section 5(b)(4) of the general permit.

- Ensuring that, in the event the authorized professional identifies a violation of the terms and conditions of the general permit, the SWPCP, or otherwise identifies adverse impacts on wetlands, streams or any other receiving waterbodies, that construction activity shall immediately cease and the site stabilized until such violation or adverse impacts have been corrected.
- Ensuring that reporting and record-keeping of all inspection checklists and inspection reports comply with the requirements of Section 5(d) of the general permit, except that a copy shall also be submitted electronically to the Department within ten (10) days from the date such inspection was performed.
- Ensuring that all inspection checklists and inspection reports comply with the requirements for Certification of Documents in Section 5(i) of the general permit, including the requirement that such checklists and reports shall also be prepared, stamped and signed by the authorized professional.
- After completion of a construction project, ensuring that a Notice of Termination is filed in compliance with Section 6 of the general permit, including the requirement that such Notice of Termination be stamped and signed by the authorized professional certifying that such authorized professional has personally inspected and verified that the site has been stabilized following the first full growing season (i.e., April through October) in the year following completion of the construction project.
- Ensuring that any transfer of the registration comply with the requirements of Section 5(m) of the general permit.

These recommendations are by no means intended to be exclusive. To help address the issues noted above, the Commissioner will also be considering the posting of a performance bond or other security, in accordance with Section 22a-6(a)(7) of the Connecticut General Statutes, to assure the solar farm construction project maintains compliance with the terms and conditions of the general permit and the SWPCP.