MILONE & MACBROOM

MEMORANDUM

TO:	Gina L. Wolfman, Senior Project Developer, Clean Focus Renewables
FROM:	Megan B. Raymond, MS, PWS, Senior Project Manager, Environmental Science
RE:	35 Taugwonk Spur Road Vernal Pool Impact Assessment
DATE:	July 30, 2019
MMI #:	6763-05

At your request, Milone & MacBroom, Inc. (MMI) evaluated the proposed activities relative to the construction of an approximately 16-acre solar array on 35 Taugwonk Spur Road in Stonington, Connecticut. The purpose of this evaluation was to determine if any potential exists for either construction activities or future use of the parcel to affect vernal pool habitat located in the southern portion of the site. As you are aware, MMI conducted a site assessment on May 20, 2019 to verify the boundaries of wetlands previously delineated by others, investigate the eastern portion of the property for inland wetlands and watercourses, and determine whether any of the delineated wetlands provide vernal pool habitat. Within the approximately 5-acres of wetlands delineated on the parcel, one small vernal pool (~2,000 ft^2), identified based on the presence of wood frog (*Lithobates sylvaticus*) tadpoles, was located in the southeastern wetland system.

Vernal pools are wetland areas that provide unique habitat attributes beyond basic wetland functions. In Connecticut, the working definition of a vernal pool is as follows: *"vernal pool means a seasonal watercourse in a defined depression or basin, that lacks a fish population and supports or is capable of supporting breeding and development of amphibian or invertebrate species recognized in such watercourses. These species include spotted salamander, Jefferson salamander complex marbled salamander, wood frog, and fairy shrimp"* (CAWS website). Vernal pool habitat is comprised of three distinct areas (Calhoun and Klemens, 2002). Specifically, 1) the vernal pool depression, which is the active breeding area, 2) the vernal pool envelope, the area within 100-feet of spring high water to the depression, and 3) the critical terrestrial habitat, which is the area within 750 feet of the depression. Critical terrestrial habitat is comprised of adjacent upland or drier wetland areas where wetland obligate amphibians spend the majority of their life cycle absent breeding. Forested areas are considered preferred overwintering habitat. Open fields lack the structural complexity in the duff layer and are not typically utilized in this capacity. In ascertaining potential impacts to vernal pool habitat, an evaluation of activities within each component of the complex is necessary.

Proposed activities demonstrate limited potential to affect vernal pool habitat on the property. No work is proposed within the vernal pool depression or within the vernal pool envelope. Hydrology to the wetland system will be maintained both in terms of water quality and quantity. Proposed activities adjacent to the vernal pool are limited as well. Approximately 4.40-acres of forest west of the hay field will be converted to open field to support the solar array. However, these activities are located outside of the critical terrestrial habitat with the closest distance of 865-feet from the depression (Figure 1). An access road is proposed within the hay field 300-feet east of the vernal pool. This activity is considered minor given the cleared nature of the field and the distance to the pool. An additional 1.44-acres of forest will be cleared at the northern property line, 1,600-feet north of the vernal pool, to install the 50-foot transmission line. This clearing will take place along an existing cart path and is located more than twice the distance of critical terrestrial habitat from the pool.

In summary, due to the scope and position of the proposed activities, the installation and utilization of a solar facility on the 35 Taugwonk Spur Road property will not adversely affect vernal pool habitat. Hydrology to the wetland will be maintained and preferred overwintering habitat will not be affected. Thus, existing population dynamics within the wetland system will be maintained.

Thank you for the opportunity to assist you. If you should have any questions or comments, please do not hesitate to contact me.

Very truly yours,

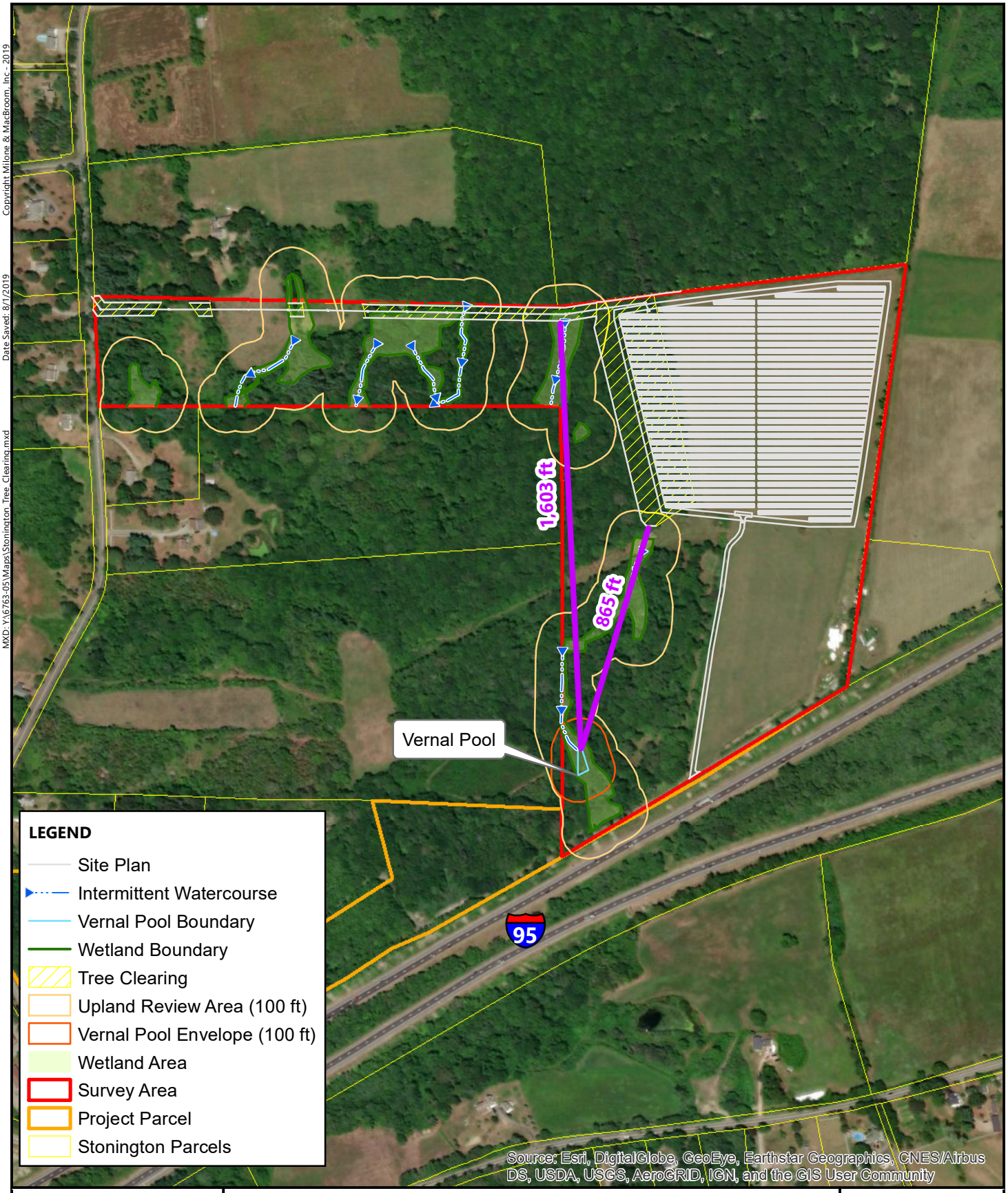
MILONE & MACBROOM, INC.

Megan B. Raymond, MS, PWS
Senior Project Manager, Environmental Science

Enclosures

References

Calhoun, A.J.K. and M.W. Klemens. 2002. Best development practices: Conserving pool-breeding amphibians in residential and commercial developments in the Northeastern United States. MCA Technical Paper No. 5, Metropolitan Conservation Alliance, Wildlife Conservation Society, Bronx, New York.



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SITE PLAN AND TREE CLEARING

STONINGTON PV SOLAR FACILITY
35 TAUGWONK ROAD
STONINGTON, CONNECTICUT

N

0 500
Feet

SCALE	1 " = 500 '
DATE	8/1/2019
PROJ. NO.	6763-05

FIG. 1

MILONE & MACBROOM

July 29, 2019

Ms. Gina Wolfman
Senior Project Developer
Clean Focus Renewables
Greenskies Renewable Energy, LLC
P.O. Box 251
Middletown, CT 06457

RE: Wetland and Watercourse Delineation
Stonington PV Solar Facility Property
35 Taugwonk Spur Road
Stonington, Connecticut
MMI #6763-05

Dear Ms. Wolfman:

As requested, I visited the property at 35 Taugwonk Spur Road in Stonington, Connecticut, to verify the boundaries of inland wetlands and watercourses within a 44-acre study area delineated by others, to determine the presence or absence of inland wetlands and watercourses on an additional 21.12 acres, and to determine presence or absence of vernal pool habitat in all wetlands identified. This letter includes the methods and results of my investigation, which was completed on May 20, 2019. Wetlands occupy 4.97 acres of the 65.12-acre study area. In general, wetland and watercourse systems on the property are comprised of broad, forested, low-gradient slope drainage corridors. One vernal pool was identified in the southern portion of the study area.

Regulatory Definitions

The Inland Wetlands and Watercourses Act (Connecticut General Statutes §22a-38) defines inland wetlands as "land, including submerged land...which consists of any soil types designated as poorly drained, very poorly drained, alluvial, and floodplain." Watercourses are defined in the act as "rivers, streams, brooks, waterways, lakes, ponds, marshes, swamps, bogs and all other bodies of water, natural or artificial, vernal or intermittent, public or private, which are contained within, flow through or border upon the state or any portion thereof." The act defines intermittent watercourses as having a defined permanent channel and bank and the occurrence of two or more of the following characteristics: A) evidence of scour or deposits of recent alluvium or detritus, B) the presence of standing or flowing water for a duration longer than a particular storm incident, and C) the presence of hydrophytic vegetation.

The Tidal Wetlands Act (Connecticut General Statutes §22a-28) defines wetlands as "those areas which border on or lie beneath tidal waters, such as, but not limited to banks, bogs, salt marsh, swamps, meadows, flats, or other low lands subject to tidal action, including those areas now or formerly connected to tidal waters and whose surface is at or below an elevation of 1 foot above local extreme high water; and upon which may grow or be capable of growing hydrophytic vegetation as identified in the Statutes."

Upland Review Area per the Town of Stonington Inland Wetlands and Watercourses Regulations, upland review area means any area within 100 feet of the boundary of any wetland.

Methodology

A second-order soil survey in accordance with the principles and practices noted in the United States Department of Agriculture (USDA) publication *Soil Survey Manual* (1993) was completed in a 65.12-acre study area within the 84-acre property. The classification system of the National Cooperative Soil Survey was used in this investigation. Soil map units identified at the project site generally correspond to those included in the *Soil Survey of the State of Connecticut* (USDA, 2005).

Wetland determinations were completed based on the presence of poorly drained, very poorly drained, alluvial, or floodplain soils and submerged land (e.g., a pond). Soil types were identified by observation of soil morphology (soil texture, color, structure, etc.). To observe the morphology of the property's soils, test pits and/or borings (maximum depth of 2 feet) were completed at the site.

Intermittent watercourse determinations were made based on the presence of a defined permanent channel and bank and the occurrence of two or more of the following characteristics: A) evidence of scour or deposits of recent alluvium or detritus, B) the presence of standing or flowing water for a duration longer than a particular storm incident, and C) the presence of hydrophytic vegetation.

Milone & MacBroom, Inc. (MMI) investigated a 65.12-acre study area for presence or absence of wetlands and watercourses and vernal pool habitat. Wetlands and watercourses were originally delineated within a 44-acre study area by Phil London, a Professional Wetland Scientist (PWS) and registered soil scientist of SWCA Environmental Consultants, on November 2018[1]. On May 20, 2019, Megan B. Raymond, MS, PWS, CFM and registered soil scientist with MMI verified the wetland boundaries and evaluated each wetland area for vernal pool habitat. MMI scientists investigated the entirety of all on-site wetlands noting edaphic, hydrologic, and biologic characteristics. MMI employed direct observation techniques as well as dip nets to evaluate aquatic biota within all wetland environments containing surface water. MMI investigated an additional 21.12 acres of agricultural field extending to the eastern property limits to determine presence or absence of wetlands and watercourses. On May 20, the weather was sunny, and the temperature was 75° Fahrenheit. The upland soil was dry, and wetland soil was moist to saturated.

Site Description and Existing Soils

The 65.12-acre L-shaped study area is located within a larger 84-acre property located at 35 Taugwonk Spur Road in Stonington, Connecticut (Figure 1). Interstate 95 abuts the southern property line. The property is located in a rural area with scattered single-family dwellings and agricultural property dominating adjacent land use. Hay fields comprise the eastern portion of the study area extending to the eastern property line and off site to the east. Successional forest segmented by stone walls and pastureland dominate the remainder of the study area. A utility easement bisects the southern portion of the property.

The study area is undeveloped and contains a mix of upland and wetland ecosystems. Upland forest consists of white ash (*Fraxinus americana*), sugar maple (*Acer saccharum*), red maple (*Acer rubrum*), red oak (*Quercus rubra*), and eastern white pine (*Pinus strobus*) canopy, northern spicebush (*Lindera benzoin*) understory, and hay-scented fern (*Dennstaedtia punctilobula*) groundcover. Successional shrub areas,

[1] Wetland and Watercourse Report, prepared by SWCA, December 6, 2018

which occupy the transition between pasture and forest, are comprised of Autumn olive (*Elaeagnus umbellata*), multiflora rose (*Rosa multiflora*), red raspberry (*Rubus idaeus*), and blackberry (*Rubus allegheniensis*). Hayfields occupy the eastern portion of the study area and site. Topography on the site slopes gently to the south. Soils are derived from glacial till parent material.

Eleven inland wetlands occupying 4.97 acres of the 65.12-acre study area were delineated (Figure 2). The wetlands on 44-acres of the study area were originally delineated in November 2018 by SWCA and verified by MMI on May 20, 2019. No wetlands were identified within the additional 21.12-acre study area investigated by MMI on May 20, 2019. The majority of wetlands on the site are broad, forested, low-gradient drainage corridors dominated by a red maple canopy and understory vegetation consisting of winterberry (*Ilex verticillata*), spicebush, sensitive fern (*Onoclea sensibilis*), cinnamon fern (*Osmundastrum cinnamomeum*), and various grasses. Two wetlands located adjacent to cleared portions of the site – horse pasture and distribution line corridor – contain palustrine emergent habitat. Emergent wetland vegetation is dominated by reed canary grass (*Phalaris arundinacea*) and soft rush (*Juncus effusus*) within the distribution line corridor and small white American-aster (*Symphyotrichum racemosum*), wrinkleleaf goldenrod (*Solidago rugosa*), late goldenrod (*Solidago gigantea*), willow herb (*Epilobium sp*.), and sensitive fern adjacent to the horse pasture. The site lies within the Stony Brook watershed. Stony Brook drains south to Stonington Harbor and Fishers Island Sound.

MMI scientists investigated the entirety of all on-site wetlands for vernal pool habitat and employed direct observation techniques as well as dip nets to evaluate aquatic biota. The majority of these wetland areas are broad, forested, low-gradient drainage corridors that lack sufficient geomorphology to provide pool habitat. However, one small 2,680-square-foot vernal pool was identified in the southern portion of the study area. Wood frog (*Lithobates sylvaticus*) tadpoles, an obligate vernal pool species, were identified in a shallow depression within the wetland boundary. The pool appeared to have sufficient hydrology to allow complete development of tadpoles to wood frog metamorphs. The boundary of vernal pool habitat was collected using a hand-held GPS – to submeter accuracy and depicted on the wetland delineation map.

In the 65.12-acre survey area, 12 soil map units were identified (11 upland and one wetland; Figure 3). Each map unit represents a specific area on the landscape and consists of one or more soils for which the unit is named. Other soils (inclusions that are generally too small to be delineated separately) may account for 10 to 15 percent of each map unit. The mapped units are by name, symbol, and typical characteristics (parent material, drainage class, high water table, depth to bedrock, and slope) (Table 1). These characteristics are generally the primary characteristics to be considered in land use planning and management. A description of each characteristic and its land use implications follows the table. A complete description of each soil map unit can be found in the *Soil Survey of the State of Connecticut* (USDA, 2005) and at *http://soils.usda.gov/technical/classification/osd/index*.

TABLE 1
Soil Unit Properties

Map Unit		Parent Material	Slope (%)	Drainage Class	High Water Table			Depth To Bedrock (in)
Sym	Name				Depth (ft)	Kind	Mos.	
Upland Soil								
34C	Merrimac fine sandy loam, 8 to 15 percent slopes	Loamy glaciofluvial deposits	8-15	Somewhat excessively drained	-	-	-	>60
43A	Rainbow silt loam, 0 to 3 percent slopes	Eolian deposits over coarse-loamy lodgment till	0-3	Moderately well drained	1.5-2.5	Perched	Jan-May; Nov-Dec	20-40
44B	Rainbow silt loam, 2 to 8 percent slopes, very stony	Eolian deposits over coarse-loamy lodgment till	3-8	Moderately well drained	1.5-2.5	Perched	Jan-May; Nov-Dec	20-40
45B	Woodbridge fine sandy loam, 3 to 8 percent slopes	Coarse-loamy lodgment till	3-8	Moderately well drained	1.5-2.5	Perched	Jan-May; Nov-Dec	20-39
50B	Sutton fine sandy loam, 3 to 8 percent slopes	Coarse-loamy melt-out till	3-8	Moderately well drained	1.0-4.9	Apparent	Jan-June; Oct-Dec	>60
73C	Charlton-Chatfield complex, 0 to 15 percent slopes, very rocky	Coarse-loamy melt-out till	3-15	Well drained	-	-	-	20-60
74C	Narragansett-Hollis complex, 3 to 15 percent slopes, very rocky	Coarse-loamy eolian deposits over sandy and gravelly melt-out till	3-15	Well drained	-	-	-	10-60
84B	Paxton and Montauk fine sandy loams, 3 to 8 percent slopes	Coarse-loamy lodgment till	3-8	Well drained	1.5-3.1	Perched	Jan-Apr; Nov-Dec	18-39
84C	Paxton and Montauk fine sandy loams, 8 to 15 percent slopes	Coarse-loamy lodgment till	8-15	Well drained	1.5-3.1	Perched	Jan-Apr; Nov-Dec	20-39
85B	Paxton and Montauk fine sandy loams, 3 to 8 percent slopes, very stony	Coarse-loamy lodgment till	3-8	Well drained	1.5-3.1	Perched	Jan-Apr; Nov-Dec	20-43
306	Udorthents-Urban land complex	Fill material	0-25	Well drained	4.5-6.0	Apparent	Jan-Apr; Nov-Dec	>60
Wetland Soil								
3	Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony	Coarse-loamy lodgment till	0-8	Poorly drained	0-2.5	Perched	Jan-June; Oct-Dec	7-60

Parent material is the unconsolidated organic and mineral material in which soil forms. Soil inherits characteristics, such as mineralogy and texture, from its parent material. Glacial till is unsorted while nonstratified glacial drift, consisting of clay, silt, sand, and boulders, is transported and deposited by glacial ice. Glacial outwash consists of gravel, sand, and silt, which are commonly stratified, deposited by glacial meltwater. Alluvium is material such as sand, silt, or clay, deposited on land by streams. Organic deposits consist of decomposed plant and animal parts.

A soil's texture affects the ease of digging, filling, and compacting and the permeability of a soil. Generally, sand and gravel soils, such as outwash soils, have higher permeability rates than most glacial till soils. Soil permeability affects the cost to design and construct subsurface sanitary disposal facilities and, if too slow or too fast, may preclude its use. Outwash soils are generally excellent sources of natural aggregates (sand and gravel) suitable for commercial use such as construction subbase material. Organic layers in soils can cause movement of structural footings. Compacted glacial till layers make excavating more difficult and may preclude the use of subsurface sanitary disposal systems or increase their design and construction costs if fill material is required.

Generally, soils with steeper slopes increase construction costs, increase the potential for erosion and sedimentation impacts, and reduce the feasibility of locating subsurface sanitary disposal facilities. Drainage class refers to the frequency and duration of periods of soil saturation or partial saturation during soil formation. There are seven natural drainage classes. They range from excessively drained, where water is removed from the soil very rapidly, to very poorly drained, where water is removed so slowly that free water remains at or near the soil surface during most of the growing season. Soil drainage affects the type and growth of plants found in an area. When landscaping or gardening, drainage class information can be used to assure that proposed plants are adapted to existing drainage conditions or that necessary alterations to drainage conditions (irrigation or drainage systems) are provided to assure plant survival.

High water table is the highest level of a saturated zone in the soil in most years. The water table can affect the timing of excavations; the ease of excavating, constructing, and grading; and the supporting capacity of the soil. Shallow water tables may preclude the use of subsurface sanitary disposal systems or increase design and construction costs if fill material is required.

The depth to bedrock refers to the depth to fixed rock. Bedrock depth affects the ease and cost of construction such as digging, filling, compacting, and planting. Shallow depth bedrock may preclude the use of subsurface sanitary disposal systems or increase design and construction costs if fill material is required.

Conclusions

On May 20, 2019, I verified the inland wetland and watercourse boundaries and evaluated wetlands for vernal pool habitat within a 65.12-acre study area located at 35 Taugwonk Spur Road in Stonington, Connecticut. The undeveloped site contains areas of forest, hayfield, and successional shrub areas. Wetlands, comprised of broad, forested, low-gradient slope drainage corridors, occupy 4.97 acres of the investigated area. One vernal pool is located in the southern portion of the property and was identified based upon the presence of wood frog tadpoles.

Thank you for the opportunity to assist you. If you should have any questions or comments, please do not hesitate to contact me.

Very truly yours,

MILONE & MACBROOM, INC.

Megan B. Raymond, MS, PWS
Senior Project Manager, Environmental Science

Enclosures

6763-05-jl2419-rpt

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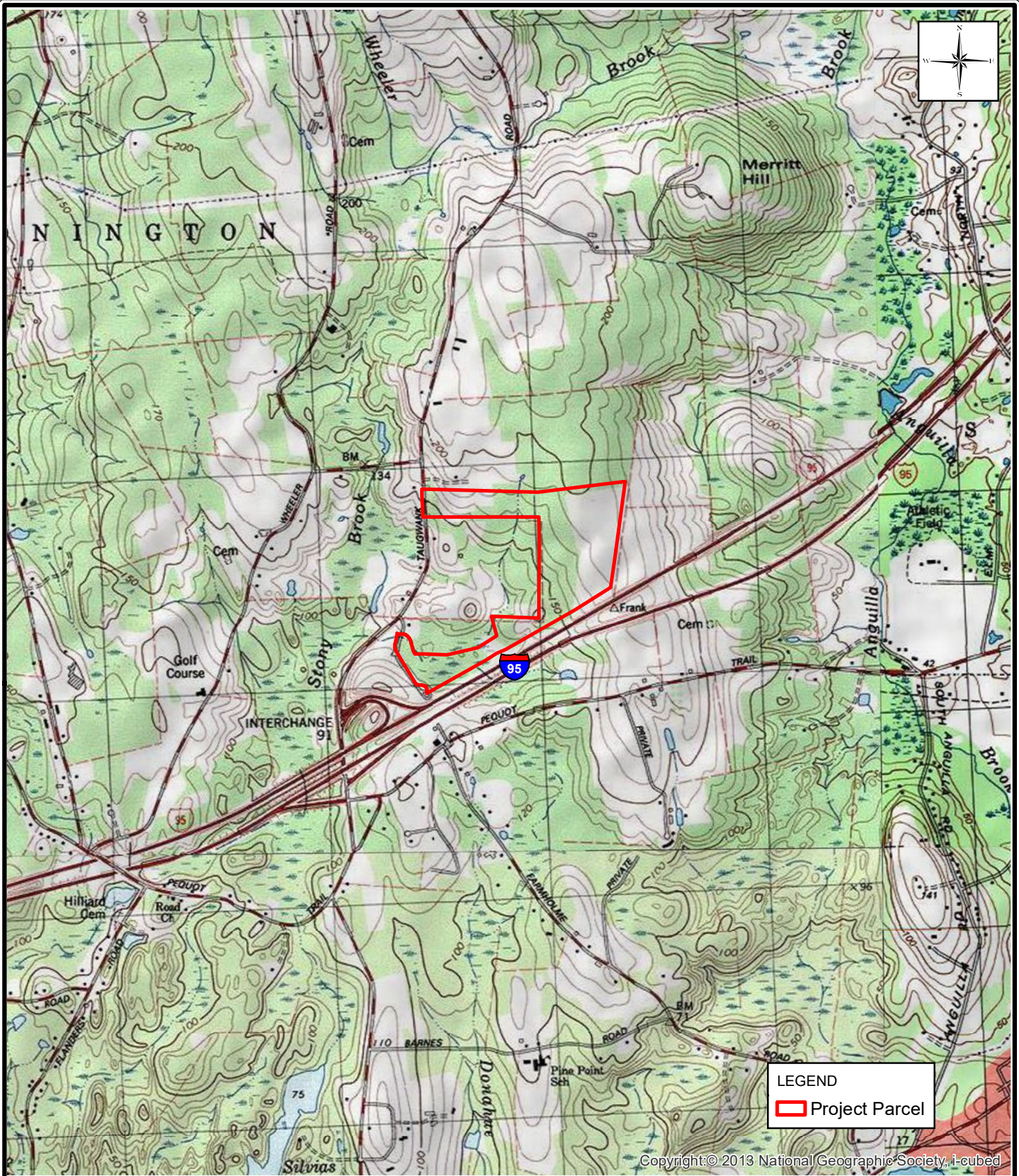

MILONE & MACBROOM

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OVERVIEW MAP

STONINGTON PV SOLAR FACILITY

35 TAUGWONK ROAD
STONINGTON, CONNECTICUT

SOURCE: 2013 NATIONAL GEOGRAPHIC SOCIETY

DATE: JULY 8, 2019		
SCALE: 1 " = 2,000 '		
PROJ. NO.: 6763-05		
DESIGNED AYO	DRAWN AYO	CHECKED MBR

DRAWING NAME:

FIG. 1

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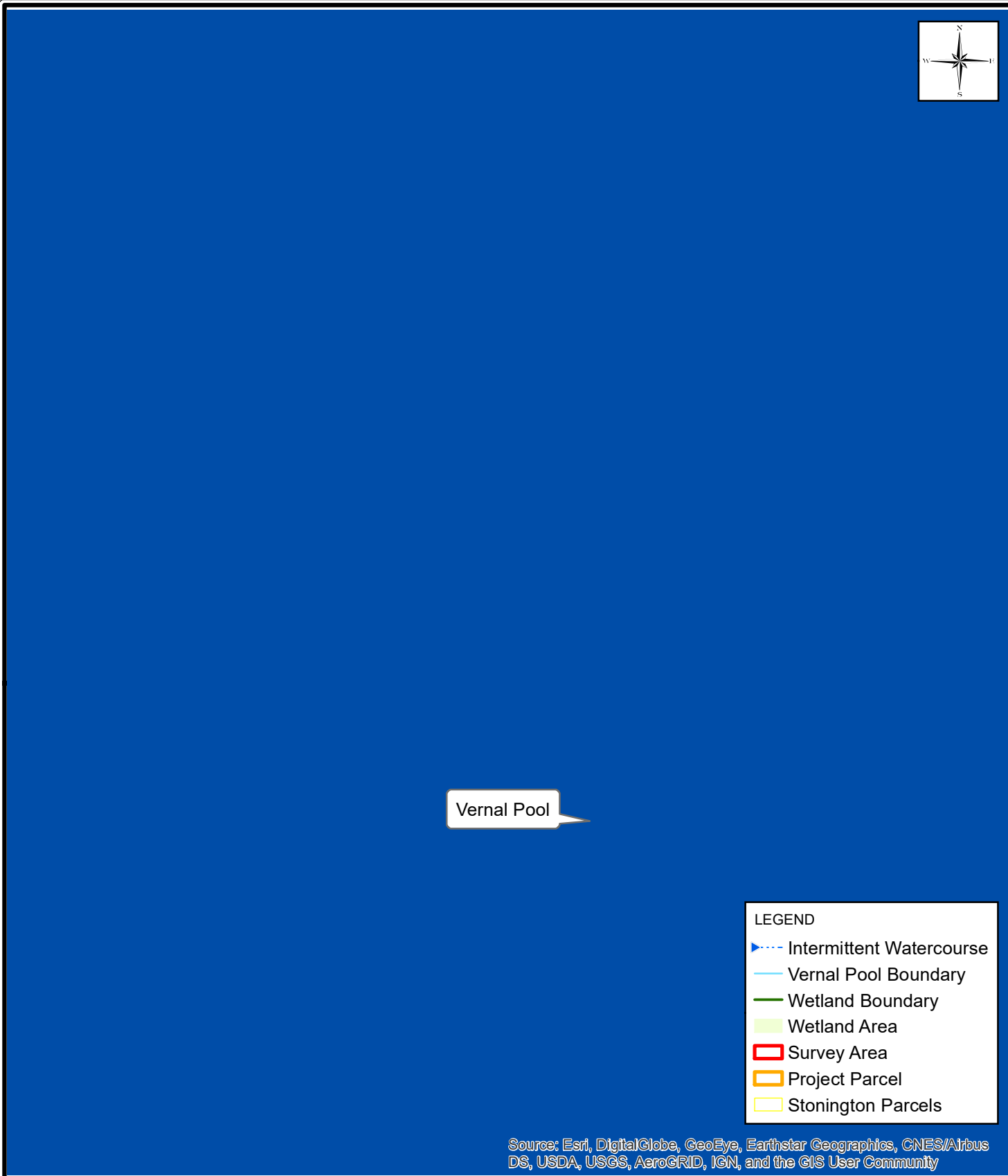

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WETLAND DELINEATION

STONINGTON PV SOLAR FACILITY

35 TAUGWONK ROAD
STONINGTON, CONNECTICUT

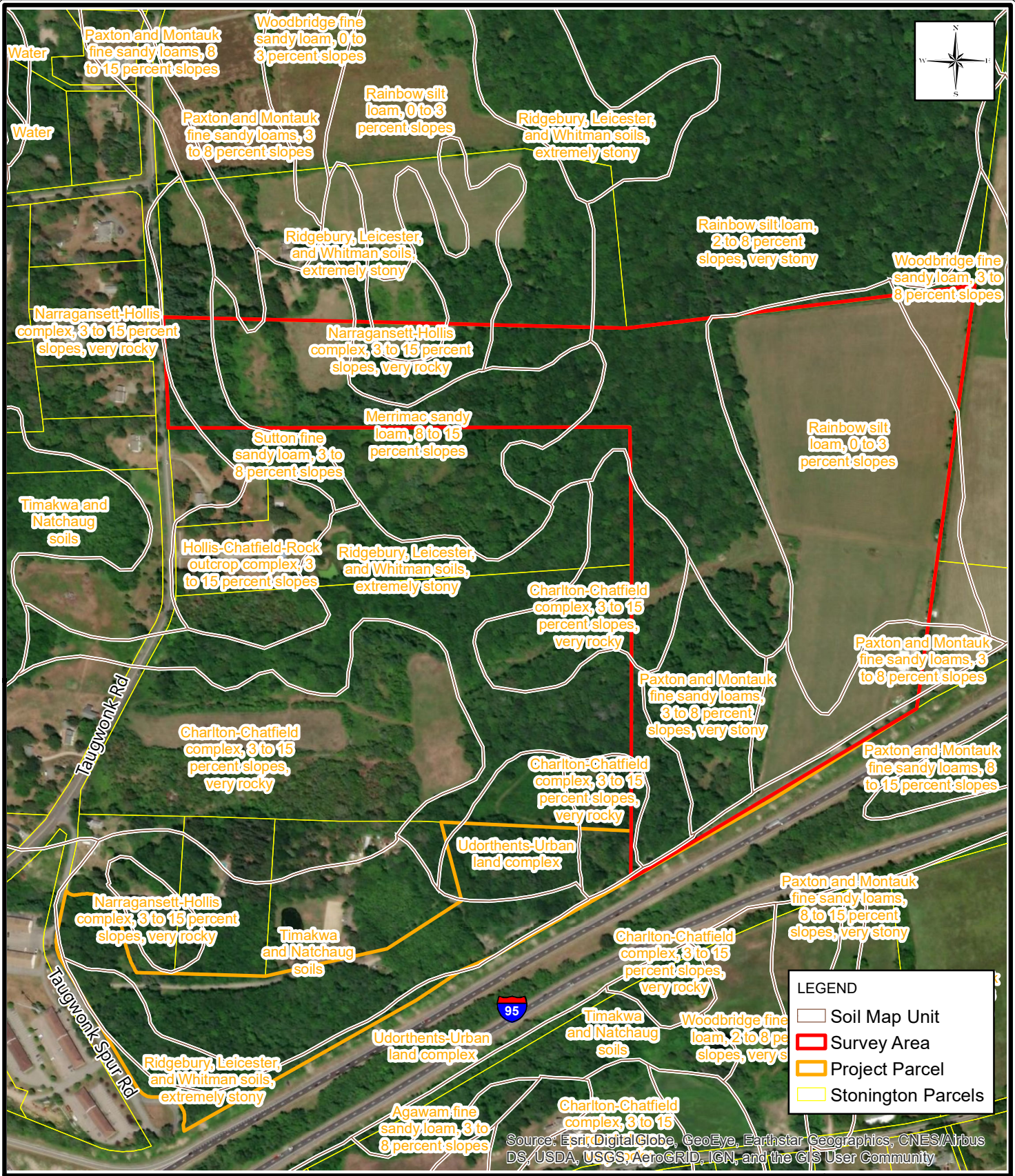
SOURCE: 2016 AERIAL PHOTO, ESRI

DATE: JULY 26, 2019		
SCALE: 1 " = 450 '		
PROJ. NO.: 1000-01		
DESIGNED AYO	DRAWN AYO	CHECKED MBR

DRAWING NAME:

FIG. 2

MXD: Y:\6763-05\Maps\Stonington_soils.mxd



MILONE & MACBROOM
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NRCS SOILS

STONINGTON PV SOLAR FACILITY

35 TAUGWONK ROAD
STONINGTON, CONNECTICUT

SOURCE: 2016 AERIAL PHOTO, ESRI

DATE: JULY 26, 2019		
SCALE: 1 " = 500 '		
PROJ. NO.: 1000-01		
DESIGNED AYO	DRAWN AYO	CHECKED MBR

DRAWING NAME:

FIG. 3

SWCA
ENVIRONMENTAL CONSULTANTS
Sound Science. Creative Solutions.®

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15 Research Drive
Amherst, Massachusetts 01002
Tel 413.256.0202 Fax 413.256.1092

December 6, 2018

Gina L. Wolfman
Senior Project Developer
Clean Focus Renewables, LLC
180 Johnson St. | Middletown, CT 06457

VIA EMAIL: gina.wolfman@cleanfocus.us

RE: Wetland Delineation Report
Taugwonk Road, Stonington, CT
SWCA Job Number: 52669

Dear Gina:

SWCA Environmental Consultants ("SWCA") completed a wetland delineation and assessment on November 5, 13, and 14, 2018 of an approximately 44-acre portion of land owned or under the control of Wayne and Suzanne Robinson of 35 Taugwonk Spur Road in Stonington, Connecticut. The delineation was completed by Phil London, a Professional Wetland Scientist (PWS) and Registered Soil Scientist with the Society of Soil Scientists of Southern New England (SSSSNE). SWCA conducted this delineation to assist Clean Focus Renewables, LLC (CFR) in evaluating this land for the potential installation and operation of a solar array with access from Taugwaonk Road. SWCA based its survey area on mapping received from CFR on October 9, 2018.

This letter report summarizes the delineation and data collected to substantiate the delineation. SWCA has structured it to assist CFR in meeting the minimum filing requirements set forth in Section 15.5.3 of the *Town of Stonington Inland Wetlands and Watercourses Regulations* ("Inland Wetland Regulations") for requesting an amendment to the Town's Inland Wetlands and Watercourses Map. The Inland Wetland Regulations require that a Soil Scientist prepare a report that documents the distribution of wetland soils on said land. Accompanying this report are figures (Appendix A), photographs that provide a representative understanding of the survey area and delineated wetland features (Appendix B), and U.S. Army Corps of Engineers Wetland Determination Data Forms (Appendix C). The data forms provide documentation on vegetation, hydrology, and soils to justify the delineated wetland boundaries at three specific locations.

1.0 Site Description

The survey area is located northeast of the Interstate 95 Exit 91 Interchange (see Figure 1 – Locus Map in Appendix A). It is generally L-shaped in configuration, extending approximately 1,985 feet north from the I-95 corridor, and then extends west for approximately 1,780 feet to the Taugwonk Road. The survey area ranges approximately 400 feet to 600 feet in width.

The survey area consists of upland forest, shrubland, horse pastures, hayfields, a maintained corridor for a single pole distribution line, forested and emergent wetlands, and three intermittent streams (see Figure 2 – Delineation Overview Map). The landscape slopes gently to the west and south. Common species in the upland forests include white ash

(*Fraxinus americana*), sugar maple (*Acer saccharum*), red maple (*Acer rubrum*), red oak (*Quercus rubra*), eastern white pine (*Pinus strobus*) , northern spicebush (*Lindera benzoin*), and hay-scented fern (*Dennstaedtia punctilobula*). Olive (*Elaeagnus* sp.), multiflora rose (*Rosa multiflora*), common red raspberry (*Rubus idaeus*), and blackberry (*Rubus allegheniensis*) are common in the shrubland. Section 2.0 describes the wetland and stream features.

According to the USDA Web Soil Survey, eleven (11) different soil map units underlie the survey area. Figure 3 (NRCS Soils Map) in Appendix A shows the distribution of these map units in the survey area. Each unit is summarized below.

- Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony (3): This map unit consists of poorly drained and very poorly drained soils along drainageways and in depressions in glacial till uplands.
- Merrimac fine sandy loam, 8 to 15 percent slopes (34C): This map unit consists of very deep, somewhat excessively drained soils formed in glacial outwash.
- Rainbow silt loam, 0 to 3 percent slopes (43A) and 2 to 8 percent slopes, very stony (44B): These map units consist of moderately well drained loamy soils formed in silty-mantled lodgement till. The soils are very deep to bedrock and moderately deep to a densic contact.
- Sutton fine sandy loam, 3 to 8 percent slopes (50B): This map unit consists of very deep, moderately well drained loamy soils formed in melt-out till.
- Charlton-Chatfield complex, 0 to 15 percent slopes, very rocky (73C): This map unit consists of moderately deep to very deep, well drained soils formed in loamy melt-out till.
- Narragansett-Hollis complex, 3 to 15 percent slopes, very rocky (74C). This map unit consists of shallow to very deep, well drained and somewhat excessively drained loamy soils formed in a mantle of medium-textured deposits overlying till.
- Paxton and Montauk, fine sandy loams, 3 to 15 percent slopes (84B and 84C), and 3 to 8 percent slopes, very stony (85B): These map units consist of well drained loamy soils formed in lodgment till or flow till. They are very deep to bedrock and moderately deep to a densic contact.
- Udorthents-Urban land complex, well drained (306): Udorthents consists of nearly level and gently sloping areas where the original soils have been cut away or covered with a fill material. Most areas have been graded to a smooth surface. Urban land classifies land covered by buildings, parking lots, and other impervious surfaces.

2.0 Wetland Resources

2.1 Delineation Methodology

SWCA surveyed all federal and state jurisdictional wetland resources located in the survey area in accordance with the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region* (Version 2.0) (Environmental Laboratory, 2012) and the Inland Wetlands Regulations. The federal delineation methodology uses a three-parameter approach where an area needs to have the presence of hydric soils, wetland surface hydrology and a dominance of hydrophytic vegetation to be a wetland. Connecticut defines its inland wetlands" based on the presence of very poorly drained, poorly drained, alluvial, and/or floodplain soils.

SWCA marked wetland boundaries in the field with pink plastic flagging labeled with an alphanumeric designation (i.e., A1, A2, A3, etc.), and then surveyed the flag points with sub-meter GPS equipment. Data was then collected on each wetland, including wetland cover types per the National Wetland Inventory classification hierarchy described by Cowardin et al. (1979). SWCA documented the wetland boundaries in three locations.

SWCA marked the Ordinary High Water Mark (OHWM) of watercourses in the survey area with blue/white stripped plastic flagging and surveyed the flag locations with sub-meter GPS equipment. The flags were marked with alphanumeric designations (i.e., MA1-101, MA1-102, etc.). The OHWM is the jurisdictional limit of non-tidal waters under Section 404 of the Clean Water Act. SWCA based the OHWM delineation on physical characteristics specified

in 33 CFR 328.3(e) including changes in character of soil, destruction of vegetation, and the presence of litter or debris (USACE, 2005).

2.2 Survey Results and Observations

SWCA delineated eleven wetlands in the survey area (see Figure 2 in Appendix A). Wetland K is the only isolated wetland; the others are bordering vegetated wetlands situated in drainageways that slope to south or west. Most of the wetlands are palustrine, forested (PFO) wetlands. Common vegetation in these PFO wetlands are red maple, winterberry (*Ilex verticillata*), spicebush, sensitive fern (*Onoclea sensibilis*), cinnamon fern (*Osmundastrum cinnamomeum*), and grasses. Two of the wetlands (Wetlands A and H) also include palustrine, emergent (PEM) components because of human alterations (i.e., distribution line, tree harvesting, horse pasture).

SWCA also delineated three intermittent streams (MA1, MA2, and MA3). Both the most current USGS quadrangle mapping (see Figure 1) and the CT Environmental Conditions Online viewer (University of Connecticut 2018) depict Stream MA1 as intermittent. Neither mapping depicts Stream MA2 or MA3. The three channels meet the definition of an intermittent watercourse identified in Section 2.1 of the Inland Wetland Regulations. This definition requires the presence of a defined permanent channel and bank and the occurrence of two or more of the following characteristics: (a) evidence of scour or deposits of recent alluvium or detritus, (b) standing or flowing water for a duration longer than a particular storm incident, and (c) hydrophytic vegetation.

SWCA found the soils underlying all wetland areas consistent with the Ridgebury, Leicester, and Whitman (3) map unit, while the stream channels have alluvial material. The following sub-sections summarize the delineated features.

2.2.1 Wetland A

Wetland A is located in the southwestern part of the survey corridor, starting near the I-95 corridor. It is largely a PFO wetland, with smaller PEM components in the maintained distribution line corridor and an area harvested for trees. Reed canary grass (*Phalaris arundinacea*) and soft rush (*Juncus effuses*) are common hydrophytes in the distribution line. SWCA demarcated Wetland A with pink flags labeled A1 to A55 and A100 to A108, and documented a data plot transect at flag A13 (see Appendix C).

2.2.2 Wetland B, C, D, E, F, and G / Intermittent Streams MA1 and MA2

These six PFO wetlands are located along an old agricultural road in the northwestern part of the survey area. This road is approximately 15 feet wide and extends in an east to west direction from the hayfields to a metal gate providing entry to a horse pasture. From the hayfield to the start of Wetland B, the road is unimproved. From Wetland B to the pasture, the road consists of rock material and is one to two feet higher in elevation than the adjacent ground surface thereby physically separating wetlands to the south (Wetlands B, D and E) from those to the north (Wetlands C, F, and G). SWCA did not delineate any part of this defined road as wetland. According to Mr. Robinson (the property owner), the existence of this agricultural road pre-dates his family's ownership of the property.

SWCA demarcated the wetland boundaries with pink flags using the following sequences:

- Wetland B: B1 to B17 (Data plot transect documented at flag B7);
- Wetland C: C1 to C6;
- Wetland D: D1 to D5;
- Wetland E: E1 to E14, E100 to E129, and E200 to E207;
- Wetland F: F1 to F3, F100 to F104; and,
- Wetland G: G1 to G7.

SWCA marked the OHWM of Streams MA1 and MA2 with blue/white stripped flags labeled MA1-100 to 114, MA1-200 to 215, MA1-300 to 301, MA1-400 to 401, and MA2-101 to 117. Stream MA1 is culverted under the agricultural road from Wetland F to Wetland E (other culverts may exist). Stream MA2 begins in the southern part of Wetland E where diffuse overland flow becomes channelized, and converges with Stream MA1 by the stone wall along the

southern survey boundary. Both channels are approximately 10 to 15 feet wide and had flowing water when observed by SWCA in November 2018 for a duration longer than a rain event. Stream MA1 also has hydrophytes in its channel in Wetland F and the northern part of Wetland E.

2.2.3 Wetland H and Stream MA3

Wetland H is a PEM/PFO wetland located in and adjacent to an active horse pasture in the northwestern part of the survey corridor. The PEM component consists of two drainageways in the northern part of the pasture, separated by an upland wooded hedgerow and stone wall, that converge further south and eventually becomes Stream MA3. Common PEM vegetation in the pasture includes small white American-aster (*Symphyotrichum racemosum*), wrinkle-leaf goldenrod (*Solidago rugose*), late goldenrod (*Solidago gigantea*), willow herb (*Epilobium* sp.), and sensitive fern. The upland hedgerow has sugar maple, white ash, multiflora rose, arrow-wood (*Viburnum dentatum*), and Morrow's honeysuckle (*Lonicera morrowii*). The PFO component is south of the pasture and has red maple in its canopy along with conifers. SWCA marked the boundary of Wetland H with pink flags labeled H1 to H39 and H100 to H108.

Stream MA3 consists of two well defined braided channels, both are approximately six to eight feet in width, although the main channel does widen to approximately 35 feet by the stone wall along the southern survey boundary to include hillside seeps. The channel had flowing water when observed in November 2018 for a duration longer than a rain event. SWCA demarcated the OHWM of Stream MA3 with blue/white stripped flags labeled MA3-100 to 106, MA3-200 to 207, and MA3-300 to 311.

2.2.4 Wetland I

Wetland I is a PFO wetland located off the west side of Stream MA3 along the southern survey boundary. It receives overflow from the stream. SWCA marked this wetland boundary with pink flags labeled I1 to I4.

2.2.5 Wetland J

Wetland J is a PFO wetland located by Taugwonk Road. The wetland appears to be supported by a series of seeps that continue flowing southward off-site. SWCA marked this wetland boundary with flags labeled J1 to J19, and documented a data plot transect at flag G6 (see Appendix C).

2.2.6 Wetland K

Wetland K is an isolated PFO wetland located further upslope from Wetland B. While the vegetative community is similar throughout this general area, SWCA observed a pocket of poorly drained soils and demarcated this wetland area with pink flags labeled K1 to K7. Non-hydric soils separate Wetland K from Wetland B.

2.2.7 100-foot Upland Review Area

Per the Inland Wetland Regulations, non-wetland and non-watercourse areas located within 100 feet of wetlands and watercourses are classified as an "Upland Review Area". Certain types of activities are regulated by the Town within this review area.

3.0 Other Protected Areas

No portion of the survey area is located within a Natural Diversity Data Base Area, which includes state and federal listed species and significant natural communities (University of Connecticut 2018).

4.0 Summary

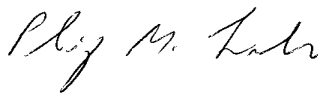
SWCA delineated eleven wetlands and three intermittent watercourses in the approximately 44-acre survey area off Taugwonk Road in Stonington, Connecticut in November 2018. SWCA conducted this delineation to assist Greenskies in evaluating the potential for a solar array with access from Taugwaonk Road. Work activities located in wetlands and/or the 100-foot Upland Review Area would likely require an inland wetland permit from the Stonington

Inland Wetlands and Watercourses Agency. Other permit approvals for the USACE and the Connecticut Department of Energy and Environmental Protection could also apply.

If you have any questions, please call Valerie Miller at (413) 256-0202 or me at (518) 944-7305.

Sincerely,

SWCA Environmental Consultants



Phil London, PWS (#2739), Registered Soil Scientist

Senior Wetland Scientist

Appendices:

A Figures

Figure 1: Site Locus
Figure 2: Delineation Overview Map
Figure 3: NRCS Soils Map

B Photographs
C Wetland Determination Data Forms

REFERENCES

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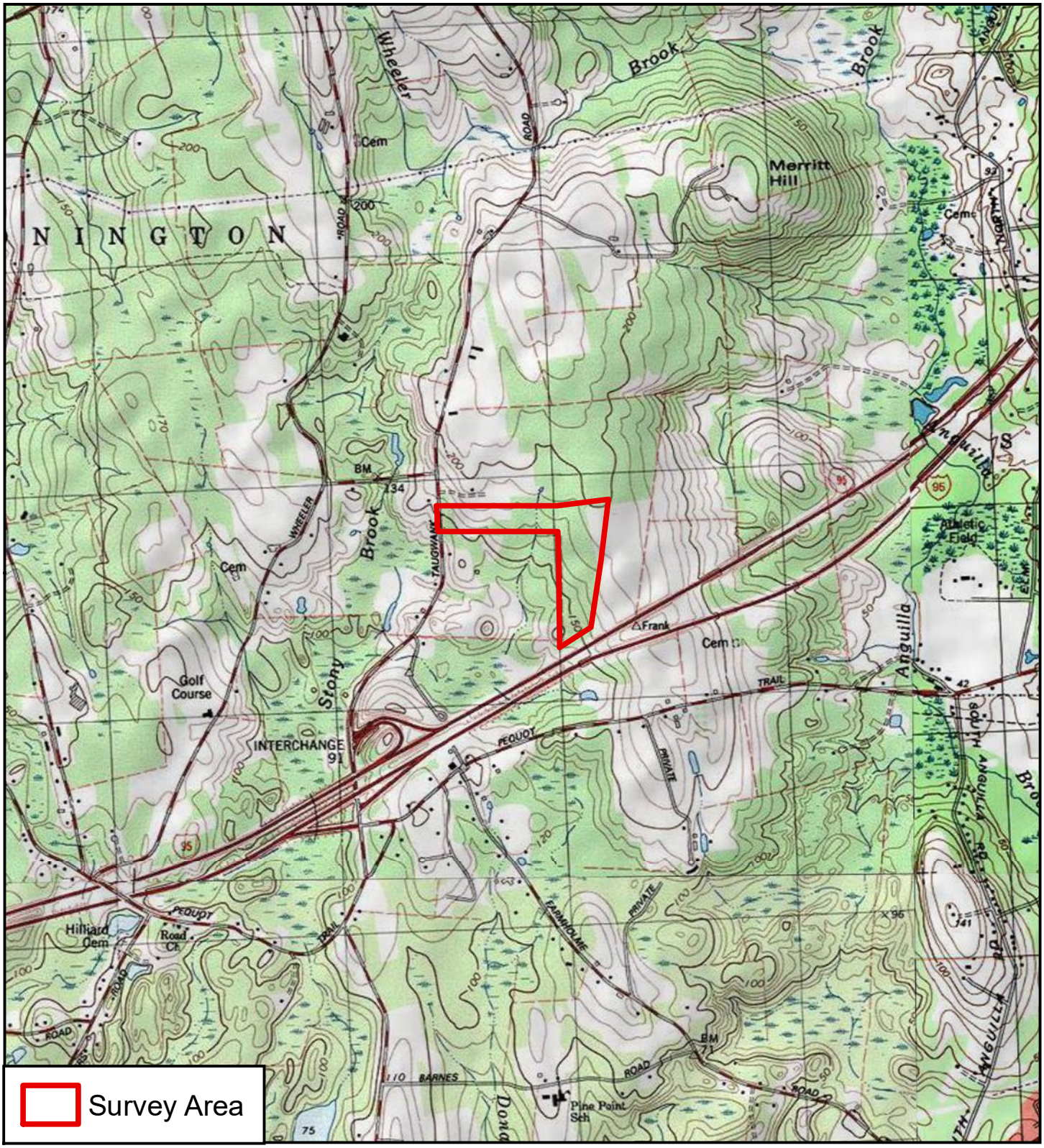
APPENDIX:

Figures



SWCA ENVIRONMENTAL CONSULTANTS

Figure 1. Locus Map

Clean Focus Renewables, LLC
Taugwonk Road
Stonington, CT

6 Dec 2018
SWCA Project No.: 52669

Data Source: Connecticut Department of Energy & Environment

0 1,000 2,000 Feet

N

Latitude 41.387983
Longitude -71.892633

SWCA®
ENVIRONMENTAL CONSULTANTS

15 Research Drive
Amherst, Massachusetts 01002
(413) 256-0202 phone
(413) 256-1092 fax
www.swca.com

Scale:	1:3,000
Created By:	JS
SWCA Project No.:	52669
Date Produced:	6 Dec 2018
Background:	e.g., 2015 Orthophotograph

N
W E
S

0 125 250 Feet

0 38.1 76.2 Meters

FIGURE 2-Delineation Overview Map

Clean Focus
Renewables, LLC

Wetland Delineation Taugwonk
Road, Stonington, CT

Delineated Features

- Stream Bank
- Wetland Line
- Wetland Area
- Survey Area

Map Unit Symbol, Map Unit, Drainage Class

- 306;Udorthents-Urban land complex;Well drained
- 34C;Merrimac sandy loam, 8 to 15 percent slopes;Somewhat excessively drained
- 3;Ridgebury, Leicester, and Whitman soils, extremely stony;Poorly drained
- 43A;Rainbow silt loam, 0 to 3 percent slopes;Moderately well drained
- 44B;Rainbow silt loam, 2 to 8 percent slopes, very stony;Moderately well drained
- 50B;Sutton fine sandy loam, 3 to 8 percent slopes;Moderately well drained
- 73C;Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky;Well drained
- 74C;Narragansett-Hollis complex, 3 to 15 percent slopes, very rocky;Well drained
- 84B;Paxton and Montauk fine sandy loams, 3 to 8 percent slopes;Well drained
- 84C;Paxton and Montauk fine sandy loams, 8 to 15 percent slopes;Well drained
- 85B;Paxton and Montauk fine sandy loams, 3 to 8 percent slopes, very stony;Well drained
- Survey Area

SWCA® ENVIRONMENTAL CONSULTANTS

Figure 3. NRCS Soils Map

Clean Focus Renewables, LLC
Taugwonk Road
Stonington, CT

6 Dec 2018
SWCA Project No.: 52669

Data Source: Connecticut Department of Energy & Environment

0 250 500 Feet

N

Latitude 41.387983
Longitude -71.892633

APPENDIX B:

Photographs

Photo 1: Data plot for Wetland A by flag A13 characterizing a wetland forest community (photo taken 11/15/18).

Photo 2: Data plot for Wetland A by flag 13 characterizing the adjacent upland forest community (photo taken 11/15/18).

Photo 3: Tree clearing in portion of Wetland A by flag A31 (photo taken 11/14/18).

Photo 4: Wetland A in maintained distribution line corridor by flag A-42 that is in emergent cover (photo taken 11/14/18). View is looking northeast.

Photo 5: Data plot for Wetland B by flag B7 characterizing a wetland forest community (photo taken 11/14/18).

Photo 6: Data plot for Wetland B by flag B7 characterizing the adjacent upland forest community (photo taken 11/14/18). View is east towards the hayfields.

Photo 7: Hayfield located in the northeastern corner of the survey area looking east from the beginning of maintained path/tree line (photo taken 11/14/18).

Photo 8: Maintained path looking northeast towards the hayfield (photo taken 11/5/18). The path is raised approximately one to two feet and comprised of stones where adjacent to Wetlands C, D, E, F and G.

Photo 9: Intermittent stream (Stream MA1) where it discharges via culvert south of the stone path (photo taken 11/5/18). Wetland D, a forested wetland, borders the stream in this location.

Photo 10: View of Wetland E, a forested wetland, looking south by flag E104 from the stone path (photo taken 11/5/18).

Photo 11: An emergent portion of Wetland H in a horse pasture looking southwest from flag H4 (photo taken 11/14/18).

Photo 12: Wetland H in the horse pasture looking northward from flag H33 (photo taken 11/14/18).

Photo 13: Intermittent stream (Stream MA3) looking southward from flag MA3-205 (photo taken 11/14/18). The stream receives drainage from Wetland H.

Photo 14: Wetland I, a forested wetland, looking eastward from flag I2 (photo taken 11/14/18). Wetland receives overflow from Stream MA3.

Photo 15: Representative view of a shrubland community located in the survey area west of the horse pasture (photo taken 11/14/18).

Photo 16: Data plot for Wetland J by flag J6 characterizing a wetland forest community (photo taken 11/14/18). Wetland J is located by Taugwonk Road.

Photo 17: Data plot for Wetland J by flag J6 characterizing an upland forest community (photo taken 11/14/18).

APPENDIX C:

Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Taugwonk Road City/County: Stonington / New London Sampling Date: 11/14/18

Applicant/Owner: Greenskies Renewable Energy, LLC State: CT Sampling Point: A PFO

Investigator(s): Philip London, PWS & Registered Soil Scientist Section, Township, Range: N/A

Landform (hillside, terrace, etc.): Drainageway Local relief (concave, convex, none): Concave Slope %: 0

Subregion (LRR or MLRA): LRR R Lat: 41.3849 Long: -71.8893 Datum: NAD83

Soil Map Unit Name: Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony (3) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area**
Hydric Soil Present?	Yes X	No ____	**within a Wetland?** **Yes** X **No** ____
Wetland Hydrology Present?	Yes X	No ____	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ____ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes X	No ____	Depth (inches): 4
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Pockets of standing water up to 2 inches present in wetland in places. Drains via culvert by flag A1 to I-95 corridor.

VEGETATION – Use scientific names of plants.

Sampling Point: A PFO

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer rubrum*	100	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	100	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. *Ilex verticillata*	12	No	FACW
2. *Ulmus americana*	15	No	FACW
3. *Lindera benzoin*	45	Yes	FACW
4. *Rosa multiflora*	10	No	FACU
5.			
6.			
7.			
	82	=Total Cover	
Herb Stratum (Plot size: 5)			
1. *Dennstaedtia punctilobula*	8	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	8	=Total Cover	
Woody Vine Stratum (Plot size: 30)			
1. *Smilax rotundifolia*	10	Yes	FAC
2.			
3.			
4.			
	10	=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	72	x 2 =	144
FAC species	118	x 3 =	354
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	200 (A)		538 (B)

Prevalence Index = B/A = 2.69

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)
See photo 1 in Appendix B.

SOIL

Sampling Point A PFO

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-11	10YR 2/1	97	2.5Y 4/2	3	D	M	Loamy/Clayey	Fine sandy loam
11-18	10YR 6/1	70	2.5Y 5/4	30	C	M	Loamy/Clayey	Fine sandy loam, organic staining

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx). This poorly drained soil is consistent with the Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony (3) map unit.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Taugwonk Road City/County: Stonington / New London Sampling Date: 11/14/18

Applicant/Owner: Greenskies Renewable Energy, LLC State: CT Sampling Point: A UPL

Investigator(s): Philip London, PWS & Registered Soil Scientist Section, Township, Range: N/A

Landform (hillside, terrace, etc.): Sideslope Local relief (concave, convex, none): Convex Slope %: 5

Subregion (LRR or MLRA): LRR R Lat: 41.3849 Long: -71.8929 Datum: NAD83

Soil Map Unit Name: Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony (3) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area**
Hydric Soil Present?	Yes ____	No X	**within a Wetland?** **Yes** ____ **No** X
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: A UPL

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer rubrum*	70	Yes	FAC
2. *Fraxinus americana*	25	Yes	FACU
3.			
4.			
5.			
6.			
7.			
	95	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. *Rubus idaeus*	12	Yes	FACU
2. *Rosa multiflora*	5	No	FACU
3. *Rubus allegheniensis*	8	Yes	FACU
4. *Lindera benzoin*	15	Yes	FACW
5.			
6.			
7.			
	40	=Total Cover	
Herb Stratum (Plot size: 5)			
1. *Osmundastrum cinnamomeum*	5	No	FAC
2. *Dennstaedtia punctilobula*	40	Yes	UPL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	45	=Total Cover	
Woody Vine Stratum (Plot size: 30)			
1. *Smilax rotundifolia*	6	Yes	FAC
2.			
3.			
4.			
	6	=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 42.9% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	15	x 2 =	30
FAC species	81	x 3 =	243
FACU species	50	x 4 =	200
UPL species	40	x 5 =	200
Column Totals:	186 (A)		673 (B)

Prevalence Index = B/A = 3.62

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)
See photo 2 in Appendix B.

SOIL

Sampling Point A UPL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-11	10YR 2/1	100					Loamy/Clayey	Fine sandy loam
11-16	2.5Y 5/4	100					Loamy/Clayey	Fine sandy loam
16-22	2.5Y 5/3	100					Loamy/Clayey	Fine sandy loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx). This moderately well to well drained soil is not hydric.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Taugwonk Road City/County: Stonington / New London Sampling Date: 11/14/18

Applicant/Owner: Greenskies Renewable Energy, LLC State: CT Sampling Point: B PFO

Investigator(s): Philip London, PWS & Registered Soil Scientist Section, Township, Range: N/A

Landform (hillside, terrace, etc.): Drainageway Local relief (concave, convex, none): Concave Slope %: 0

Subregion (LRR or MLRA): LRR R Lat: 41.3894 Long: -71.8934 Datum: NAD83

Soil Map Unit Name: Rainbow silt loam, 2 to 8 percrent slopes, very stony (44B) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area**
Hydric Soil Present?	Yes X	No ____	**within a Wetland?** **Yes** X **No** ____
Wetland Hydrology Present?	Yes X	No ____	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ____ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes X	No ____	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Pockets of standing water up to 2 to 3 inches are present throughout the wetland.

VEGETATION – Use scientific names of plants.

Sampling Point: B PFO

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer rubrum*	100	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	100	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. *Ilex verticillata*	5	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	5	=Total Cover	
Herb Stratum (Plot size: 5)			
1. Solidago rugosa	8	Yes	FAC
2. *Viburnum dentatum*	5	Yes	FAC
3. Unknown grass (60 percent)			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	13	=Total Cover	
Woody Vine Stratum (Plot size: 30)			
1. *Smilax rotundifolia*	10	Yes	FAC
2.			
3.			
4.			
	10	=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	5	x 2 =	10
FAC species	123	x 3 =	369
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	128 (A)		379 (B)

Prevalence Index = B/A = 2.96

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)
The unknown grass resembles Glyercia sp., but a positive identification could not be made at this time in the season. It covered about 60 percent of the ground layer. See photo 5 in Appendix B.

SOIL

Sampling Point B PFO

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 2/1	100					Loamy/Clayey	Fine sandy loam
1-8	10YR 3/1	100					Loamy/Clayey	Fine sandy loam
8-10	10YR 3/1	90	7.5YR 3/4	10	C	M	Loamy/Clayey	Prominent redox concentrations
10-18	2.5YR 6/2	70	10YR 4/6	30	C	M	Loamy/Clayey	Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx). This poorly drained soil is consistent with the Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony (3) map unit.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Taugwonk Road City/County: Stonington / New London Sampling Date: 11/14/18

Applicant/Owner: Greenskies Renewable Energy, LLC State: CT Sampling Point: B UPL

Investigator(s): Philip London, PWS & Registered Soil Scientist Section, Township, Range: N/A

Landform (hillside, terrace, etc.): Sideslope Local relief (concave, convex, none): Convex Slope %: 5

Subregion (LRR or MLRA): LRR R Lat: 41.3894 Long: -71.8932 Datum: NAD83

Soil Map Unit Name: Rainbow silt loam, 2 to 8 percrent slopes, very stony (44B) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area**
Hydric Soil Present?	Yes ____	No X	**within a Wetland?** **Yes** ____ **No** X
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: B UPL

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer rubrum*	70	Yes	FAC
2. *Quercus rubra*	20	Yes	FACU
3. *Carpinus caroliniana*	8	No	FAC
4.			
5.			
6.			
7.			
	98	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. *Ilex verticillata*	5	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	5	=Total Cover	
Herb Stratum (Plot size: 5)			
1. *Osmundastrum cinnamomeum*	8	Yes	FAC
2. *Dennstaedtia punctilobula*	6	Yes	UPL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	14	=Total Cover	
Woody Vine Stratum (Plot size: 30)			
1. *Smilax rotundifolia*	5	Yes	FAC
2.			
3.			
4.			
	5	=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	5	x 2 =	10
FAC species	91	x 3 =	273
FACU species	20	x 4 =	80
UPL species	6	x 5 =	30
Column Totals:	122 (A)		393 (B)

Prevalence Index = B/A = 3.22

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)
The unknown grass resembles Glyercia sp., but a positive could not be made at this time in the season. It covered about 60 percent of the ground layer. See photo 6 in Appendix B.

SOIL

Sampling Point B UPL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 2/1	100					Loamy/Clayey	Sandy loam
5-8	10YR 3/3	100					Loamy/Clayey	Sandy loam
8-17	10YR 4/4	100					Loamy/Clayey	Sandy loam
17-24	2.5YR 5/4	90	10YR 5/6	10	C	M	Loamy/Clayey	Sandy loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx). This moderately well drained soil is not hydric.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Taugwonk Road City/County: Stonington / New London Sampling Date: 11/13/18

Applicant/Owner: Greenskies Renewable Energy, LLC State: CT Sampling Point: J PFO

Investigator(s): Philip London, PWS & Registered Soil Scientist Section, Township, Range: N/A

Landform (hillside, terrace, etc.): Drainageway Local relief (concave, convex, none): Concave Slope %: 0

Subregion (LRR or MLRA): LRR R Lat: 41.3890 Long: -71.8992 Datum: NAD83

Soil Map Unit Name: Sutton fine sandy loan, 3 to 8 percent slope (50B) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area**
Hydric Soil Present?	Yes X	No ____	**within a Wetland?** **Yes** X **No** ____
Wetland Hydrology Present?	Yes X	No ____	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)
Wetland drains souhward off site.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ Microtopographic Relief (D4)
- ____ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): 1
Water Table Present?	Yes X	No ____	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: J PFO

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer rubrum*	55	Yes	FAC
2. *Fraxinus americana*	30	Yes	FACU
3. *Pinus strobus*	10	No	FACU
4.			
5.			
6.			
7.			
	95	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. *Ilex verticillata*	15	Yes	FACW
2. *Rosa multiflora*	3	No	FACU
3.			
4.			
5.			
6.			
7.			
	18	=Total Cover	
Herb Stratum (Plot size: 5)			
1. Unknown grass			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
		=Total Cover	
Woody Vine Stratum (Plot size: 30)			
1. *None*			
2.			
3.			
4.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	15	x 2 =	30
FAC species	55	x 3 =	165
FACU species	43	x 4 =	172
UPL species	0	x 5 =	0
Column Totals:	113 (A)		367 (B)

Prevalence Index = B/A = 3.25

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)
Pin oak and Carex lurida are also present in the wetland. The unknown grass resembles Glyercia sp., but a positive identification could not be made at this time in the season. It covered about 60 percent of the ground layer. See photo 16 in Appendix B.

SOIL

Sampling Point J PFO

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/1	100					Loamy/Clayey	Silt loam
10-18	2.5Y 6/2	80	2.5Y 5/4	20	C	M	Loamy/Clayey	Distinct redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx). This poorly drained soil is consistent with the Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony (3) map unit.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Taugwonk Road City/County: Stonington / New London Sampling Date: 11/13/18

Applicant/Owner: Greenskies Renewable Energy, LLC State: CT Sampling Point: J UPL

Investigator(s): Philip London, PWS & Registered Soil Scientist Section, Township, Range: N/A

Landform (hillside, terrace, etc.): Hillside Local relief (concave, convex, none): Convex Slope %: 0

Subregion (LRR or MLRA): LRR R Lat: 41.3891 Long: -71.8992 Datum: NAD83

Soil Map Unit Name: Sutton fine sandy loan, 3 to 8 percent slope (50B) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area**
Hydric Soil Present?	Yes ____	No X	**within a Wetland?** **Yes** ____ **No** X
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID:

Remarks: (Explain alternative procedures here or in a separate report.)
Upland plot is higher in elevation than adjacent wetland and borders a successional shrubland community (old clearing). Wetland boundary is at toe-of-slope.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ? Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): 1
Water Table Present?	Yes X	No ____	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: J UPL

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer saccharinum*	20	Yes	FACW
2. *Pinus strobus*	8	Yes	FACU
3. *Picea sp.*			
4.			
5.			
6.			
7.			
	28	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. *Pinus serotina*	15	No	
2. *Rosa multiflora*	25	Yes	FACU
3. *Rubus allegheniensis*	55	Yes	FACU
4. *Acer saccharinum*	5	No	FACW
5.			
6.			
7.			
	100	=Total Cover	
Herb Stratum (Plot size: 5)			
1. *Nonea*			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
		=Total Cover	
Woody Vine Stratum (Plot size: 30)			
1. *Lonicera japonica*	10	Yes	FACU
2.			
3.			
4.			
	10	=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 20.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	25	x 2 =	50
FAC species	0	x 3 =	0
FACU species	98	x 4 =	392
UPL species	0	x 5 =	0
Column Totals:	123 (A)		442 (B)

Prevalence Index = B/A = 3.59

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)
Shub layer is dense. See photo 17 in Appenix B.

SOIL

Sampling Point J UPL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 3/1	100					Loamy/Clayey	Silt loam
2-3	10YR 4/1	100					Loamy/Clayey	Silt loam
3-18	7.5YR 3/2	100					Loamy/Clayey	Fine sandy loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx). This moderaretely well to well drained soil is consistent with the Sutton map unit.