PETITION OF WINDHAM SOLAR LLC

PLAINFIELD PIKE SOLAR FACLITY

FOR A DECLARATORY RULING FOR THE CONSTRUCTION AND OPERATION OF TWO 1.0 MEGAWATT AND ONE 1.5 MEGAWATT SOLAR PHOTOVOLTAICRENEWABLE ENERGY GENERATING FACILITIES LOCATED AT 91 PLAINFIELD PIKE ROAD, PLAINFIELD, CONNECTICUT

March 15, 2016

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I. INTRODUCTION

Pursuant to Section 16-50k(a) and Section 4-176(a) of the Connecticut General Statutes ("CGS") and Section 16-50j-38 *et seq.* of the Regulations of Connecticut State Agencies ("RCSA"), Windham Solar LLC (the "Petitioner") requests that the Connecticut Siting Council (the "Council") issue a declaratory ruling approving the construction and operation of the Petitioner's two (2) 1.0 megawatt and one (1) 1.5 megawatt ("MW") solar electric generating facilities (the "Facilities"), located on industrial and residential-zoned land at 91 Plainfield Pike Road in the Town of Plainfield, Connecticut (the "Site").

CGS § 16-50k(a) provides:

> "Notwithstanding the provisions of this chapter or title 16a, the council shall, in the exercise of its jurisdiction over the siting of generating facilities, approve by declaratory ruling . . . (B) the construction or location of . . . any customer-side distributed resources project or facility . . . with a capacity of not more than sixty-five megawatts, as long as such project meets the air and water quality standards of the Department of Energy and Environmental Protection . . ."

Pursuant to CGS § 16-50k(a), the Council should approve the Facilities by declaratory ruling since they are customer-side distributed resources facilities under 65 MW in capacity that comply with the air and water quality standards of the Connecticut Department of Energy and Environmental Protection ("DEEP"). Further, CGS § 16a-35k establishes the State's energy policies, including the goal to "develop and utilize renewable energy resources, such as solar and wind energy, to the maximum extent possible." As demonstrated from the information included in this petition, the Facilities will result in no air emissions, have minimal impacts that comply with DEEP's air and water quality standards, and will have no substantial adverse environmental effects. The Facilities will further the State of Connecticut's energy policy by developing renewable energy resources. The Facilities also further the State of Connecticut's goals announced in the 2013 Comprehensive Energy Strategy (the "CES"). "Connecticut has suffered

from some of the country's worst air pollution, in part due to its geographic location downwind of out-of-state coal- and oil-burning power plants. A cleaner energy future requires support for electricity generation from low- or no-emission sources."[1] The Facilities will be an important part of that cleaner energy future. The CES also emphasizes the necessity for the "development of more distributed generation", which the Facilities are.[2]

II. PETITIONER

Windham Solar LLC was organized in 2014 by New-York based Allco Renewable Energy Limited for the purposes of developing, constructing, and operating the Facilities in the State of Connecticut. Project development activities are supported by Ecos Energy LLC ("Ecos"). Ecos, based in Minneapolis, MN, has developed and managed the construction/operation of 28 MW of solar PV generation spread over 17 project sites nationwide. Both the Petitioner and Ecos have the knowledge and experience to develop and implement the Facilities in a way that maximizes benefits to the citizens of Connecticut, with no significant adverse impacts.

Correspondence and/or communications regarding this petition should be addressed to:

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[1] *See*, 2013 Comprehensive Energy Strategy for Connecticut, p. 70, available at http://www.ct.gov/deep/lib/deep/energy/cep/2013_ces_final.pdf
[2] Id. at p. 71.

III. DESCRIPTION OF PROPOSED PROJECT

The State of Connecticut has recognized the benefits of local renewable energy development and implemented renewable portfolio standard ("RPS") to encourage the development of renewable energy resources not only to lessen the country's dependence on foreign oil but also to reduce the environmental impacts associated with fossil fuel sources. The RPS requires that by 2020, twenty percent of electricity generation must be derived from Class I renewable energy sources such as solar PV.

The Facilities will play an important role in the State's renewable energy goals. The Facilities will provide a significant source of clean, renewable energy produced locally. The Facilities will produce 100 percent clean, renewable electricity with zero emissions will result in significant environmental benefits. Further, the Facilities will act as a peak reducer by producing energy during the electric distribution companies' peak load hours. The project will therefore help moderate peak load requirements and reduce the demand on transmission lines.

A. Site Selection

The Site was selected based upon a number of factors including:

1. Size Zoning: The easterly 21.4 acres is zoned I-1 (industrial zoning). The Facilities are a permitted use on the Property in the industrial (I-1) district per the zoning code of the Town of Plainfield, CT. The westerly 47.7 acres is zoned RA-19 (residential zoning). Solar facilities are not addressed in the RA-19 zoning district, however, the use is consistent with the character of the area and abutting industrial zoning districts. Furthermore, the Facilities will be screened by existing vegetation making the Facilities 100% screened from adjacent properties and roadways.

2. Site Suitability (solar resource, soil, and topographic characteristics that allow for efficient facility design and construction), and
3. Site Resources (lack of sensitive natural resources onsite—the Site contains no rare, protected, or sensitive natural resources that would be adversely impacted by the Facilities' footprint.), and
4. Proximity to electrical infrastructure and roadways—the Site has direct public road access and is directly adjacent to an Eversource electric distribution line.
5. Available for Sale – The site was listed for sale through a licensed Connecticut real estate broker.

B. Site Description

The Site is located at 91 Plainfield Pike Road, Plainfield, CT. The Site is a 67.2 acre parcel that is zoned 'I-1 Industrial and RA-19 Residential.' The Site is currently vacant and contains no structures. The entire site is completely wooded as of the date of this application. Approximately 18.5 acres of the Site have been delineated as wetlands. Topography undulates on the site, with two upland areas central to the site, and one upland area on the east property line. The solar facility will located on the three upland areas with a total footprint of 16.9 acres as delineated by the projects fence limits. Each solar area will be connected by a 14 foot gravel access roadways throughout site. Three wetland crossings totaling 0.28 acres of impact will need to occur for site access. The crossings will be be permitted with the Army Corps of Engineers, given the impacts are greater than 0.1 acres. Adjacent parcels are currently being used for uncleared vacant land, light agriculture, commercial and a small number of residences to the north of the Site. An ALTA Survey showing the Site's general location, characteristics, and boundaries can be found on Sheet 2 of Exhibit A (Facilities Site Plan). Exhibit B (Soils and

Wetlands Map) shows an aerial view of the Site. Exhibit C (Cross Sections and Key Observation Point Plan) contains photographs of the Site taken from ground level, as well as cross sections of the sight lines from the adjacent roadway.

C. Project Description

The Facilities are renewable energy generation facilities that will use PV solar modules to convert solar radiation to electricity. They will be located on the customer side of the Eversource meter. Each Facility will consist of approximately 3,395 solar modules (based on a module rating of 345 watts). The solar modules will be supported above the ground by a steel and aluminum fixed-tilt racking system. The modules will be oriented directly due south at a tilt angle of approximately 15 degrees. Solar modules will be mounted to the racking system in portrait orientation, with two rows of modules per rack. The racking system will support the modules to maintain a ground clearance of at least 18 inches. The racking system will be supported above the ground by a series of steel h-beams that are direct-driven into the ground, requiring no concrete foundations. The length of h-beam embedment will be determined following a geotechnical and structural analysis; 6 to 8 feet embedment is typical. The solar modules will be wired in series strings of 18 modules per string. Strings will be connected to 1,000 kilowatt (kW) centralized solar inverters. The inverters alter the DC output of the solar modules to 390V three-phase alternating current ("AC") output.

Output from the inverters will feed into a step-up transformer services to increase the collected 390V three-phase AC output to 23kV (or other, as required) for interconnection to Eversource's distribution system. Output from the transformer will be connected via underground cabling to a pad-mounted fused master AC disconnect switch for the Project. This

output will be connected to a pad-mounted automated recloser, which will provide automated overcurrent protection to the Project and to Eversource's distribution/transmission system. Output from the recloser will run through a set of Eversource metering equipment before being connected to the nearby Eversource distribution circuit.

Each facility will contain a centralized equipment skid that will contain the inverters, transformer, disconnect switches, a suite of monitoring and communications equipment, as well as controls for the Facilities' video security system. In addition to the solar energy generating equipment described above, the Facilities will include a 14-foot wide gravel driveway for operations, maintenance, and emergency access. Also, the entirety of the Site footprint will be surrounded by a 7.5 foot tall chain-link security fence. Access to the Site will be via a padlocked gate in the perimeter fence at the location of the Facilities' access driveway off of Plainfield Pike Road. A series of infrared, motion-sensitive video security cameras will be installed around and within the perimeter fence. No night-time lighting of any kind is proposed for the Facilities. After construction, the ground area within the Facilities' footprint will be hydro-seeded with an architect-reviewed seed mix that offers low/slow growing groundcover vegetation that is drought-tolerant and native. A row of existing trees and natural vegetation will be maintained around the perimeter of the Site to shield it from view along the roadways and from neighboring properties. The Facilities' footprint area will encompass 16.9 acres of the Site, all within the Facilities' perimeter fence line. All elements of Facilities' design, construction, operation, and maintenance will be performed in accordance with all applicable local, state, and national rules, guidelines, and regulations. The particulars of each Facility's footprint design and equipment locations can be seen in detail in Exhibit A.

D. Interconnection

Each Facility is proposed to be interconnected to the Eversource electric distribution grid at an existing 23 kV overhead electric line located along Plainfield Pike Road. The interconnection would be in accordance with Eversource technical standards and State of Connecticut, ISO-New England ("ISO-NE"), and the Federal Energy Regulatory Commission ("FERC") requirements. The interconnection will consist of Eversource-specified metering and protection (breakers/switches/relays) to be installed for each Facility. The interconnection will be made pursuant to Eversource's Guidelines for Generator Interconnection. As part of the interconnection process, the Petitioner has successfully completed an interconnection application request, and an application review and will be working toward completing a System Impact Study ("SIS") with Eversource in the coming months. The SIS is expected to include:

1. Circuit Modeling
2. Power Flow Analysis
3. Voltage Impact Study
4. Thermal Impact Study
5. Short Circuit Study
6. Distribution Requirement Interruption Ratings
7. Protection Coordination
8. Transfer Trip Requirements
9. Protection Schemes
10. Costs of Required Network Upgrades

Upon completion of the SIS, the Petitioner will review the requirements for interconnection and enter into an Interconnection Agreement ("IA") with CL&P for each Facility.

E. Service Life and Capacity Factor

Each Facility's equipment has an expected useful life of approximately 45 years, and the Petitioner would plan to operate each Facility until the equipment has exhausted its useful life. According to the 2012 Integrated Resources Plan for Connecticut, PV solar has an expected capacity factor of approximately 13 percent.

IV. PROJECT BENEFITS

Projects that are "necessary for the reliability of the electric power supply of the state or for a competitive [electric market]" present a clear public benefit. Conn. Gen. Stat. § 16-50p(c)(1). Each Facility provides exactly the benefit contemplated in the statute and more, as it will generate much of its power at peak times. By providing electricity when there is high demand, each Facility will help stabilize the electrical grid.

Additionally, there exists a clear public need for renewable projects and undertaking them supports the State's energy policies as codified in Conn. Gen. Stat. § 16a-35k, expressing the legislature's goal to "develop and utilize renewable energy resources, such as solar and wind energy, to the maximum practicable extent." Solar facilities are considered Class I renewable energy sources under General Statutes § 16-1(a)(26). Over the life of each Facility, each Facility will contribute to a significant reduction in NOx, SOx, PM, CO and VOC emissions as compared to combustion-based generation. These figures are further outlined *infra.* Additionally, each Facility will deliver its generated power 'locally' by injecting that power into a distribution-level electric circuit for use by nearby homes and business. This decreases the amount of power that will need to be brought into the area from further away, lightening the load on utility transmission infrastructure and increasing local grid reliability.

Each Facility will also help the State move closer to meeting its renewable portfolio standards. Further, providing increased renewable capacity helps further distance Connecticut from foreign energy supply and helps support energy independence, a local and national goal. Concerning Project labor, the Company fully intends to employ local labor in completing the Project wherever practical. As part of larger state, national, and global strategies, reductions in greenhouse gas emissions from this Project will have long-term secondary biological, social, and

economic benefits. Similarly, the advancement of renewable resources at a distributed level contribute to our Nation's desire for energy independence and reduces our dependency upon foreign countries where geo-political issues may introduce issues with the reliability of their fuel supply. The project will also hire local labor, as practical, and be a source of increased revenue for local businesses during construction.

V. LOCAL INPUT & NOTICE

The Petitioner has contacted the Town of Plainfield Planning and Engineering Department Supervisor and submitted draft plans to them for input. The initial reaction was positive, and the petitioner will be meeting with town staff on March 22nd, 2016, to discuss the project further. The facilities have been sited and designed to local setback requirements and zoning codes and shall be a positive addition to the community by complying with local siting requirements.

In addition to contacting the Town directly, the Petitioner provided notice of this petition to all persons and appropriate municipal officials and government agencies to whom notice is required pursuant to CGS § 16-50j-40(a). For details, reference Exhibit D (Notice Service List).

VI. POTENTIAL ENVIRONMENTAL EFFECTS

The Petitioner has evaluated the Site and taken inventory of the resources available onsite. The Facilities' have been designed so as to be compatible with the existing environment while avoiding, reducing, and mitigating potential environmental impacts.

A. Natural Environment and Ecological Balance.

The Site selected for the Facilities' footprint is not an area with any sensitive, rare, or protected natural resources. The area needed to construct the Facilities will be cleared of any tree/timber vegetation. These removals are detailed on Sheets 5 and 6 of Exhibit A. Minimal

grading will be required for each Facility, as the solar racking equipment is designed to follow the existing contour of the Site's topography. The minimal grading will be performed to create the access driveway and transformer equipment pads. These areas would be less than 1 acre in total. A Phase I Environmental Site Assessment ("ESA") was performed at the Site. The ESA did not recognize any environmental conditions that warranted additional investigation or action in the area of the Site encompassed by the Facilities' footprint. For details, see Exhibit E (Phase I Environmental Site Assessment). No hazardous substances or materials will be used or stored onsite during construction or operation.

B. Public Health and Safety

Overall, each Facility will meet or exceed all health and safety requirements applicable for electric power generation. During construction, each employee working onsite will:

1) Receive required general and site specific health and safety training.
2) Comply with all health and safety controls as directed by local and state requirements.

i) Understand and employ the site health and safety plan while on the job site.

3) Know the location of local emergency care facilities, travel times, ingress and egress routes.
4) Report all unsafe conditions to the construction managers.

During construction, heavy equipment, delivery trucks, and water trucks for dust suppression will be required to access the Site during normal weekday working hours. It is anticipated that approximately 16 to 20 construction vehicles would make daily trips onto the Site during the approximately 4 month construction period. During operation, construction noise may be audible offsite. Therefore, all work will be conducted during normal weekday working

hours, and it is not anticipated that any levels of construction noise will exceed state or local noise limit standards. During operation, the Facilities will not present a health or safety hazard to anyone located offsite. The Facilities will generate no offsite noise, harmful glare, vibrations, or damaging emissions of any kind. PV solar is a long-proven safe and benign generation technology. Authorized personnel visiting the Facilities during operation will be fully licensed and properly trained on how to navigate a solar project safely and how to quickly respond in the event of an emergency. Once operational, the Petitioner will work with local fire and law enforcement officials to ensure they have the appropriate knowledge and access to provide their services to the Facilities if necessary.

C. Air Quality

Overall, the Facilities will have minor air emissions of regulated air pollutants and greenhouse gases during construction and no air permit will be required. During construction, any air emission effects will be temporary and will be controlled by enacting appropriate mitigation measures (e.g. water for dust control, avoiding mass early morning vehicle startups, etc.). Accordingly, any potential air effects as a result of the Facilities' construction activities will be negligible. During operation, the Facilities will not produce air emissions of regulated air pollutants or greenhouse gases (e.., PM10, PM2.5, VOCs, GHG, or Ozone). Thus, no air permit will be required. Moreover, over 45 years, the Facilities will result in the offset/elimination of approximately 115,000 tons of CO_2 equivalent, which is equal to 21,000 vehicles off the road, 37,700 tons of avoided landfill waste, 24 tons of NO_X emissions avoided, or 59 tons of SO_2 emissions avoided. The Facilities will have a net benefit effect on air quality.

D. Scenic Values and Visual Renderings

Once installed, the Facilities will be not be visible to neighboring property owners nor visible to drivers and passengers traveling on Plainfield Pike Road The solar equipment being installed has a low profile; less than 9 feet in height, with the exception of a few taller poles for video cameras and meteorological equipment. The Facilities would be set far enough back from Plainfield Pike Road and adjacent property boundaries so that a robust buffer of trees and natural vegetation can be maintained so that the Facilities will be completely screened from neighboring properties in the area. No other perimeter screening will be necessary to screen the Facilities from neighboring properties since the existing trees and vegetation are thick enough to provide adequate screening. There are no protected or designated scenic areas, roadways, or trails within visual range of the Site. Given these details, the Facilities would not have a significant adverse effect on the scenic values of the area. Current photographs of the Site, along with a key observation point plan of the Facilities, can be found in Exhibit C.

E. Historic Values

The Petitioner has requested review of the Facilities and Site by the Connecticut State Historic Preservation Office ("SHPO"). At the time of filing, the Petitioner has not yet received a response from SHPO, other than one indicating a probable delay due to significant backlog of review requests. The Petitioner will submit the SHPO response to the Council as soon as it is received.

F. Wildlife & Habitat

The Facilities have been designed to avoid any impacts to sensitive plant or wildlife species or the associated habitats. Three analysis were performed to identify the potential for any sensitive species or habitat:

1) Phase I Environmental Site Assessment (Exhibit E)
2) Wetlands Report (Exhibit F)
3) A Request for Natural Diversity Database ("NDDB") State Listed Species Review by Connecticut Department of Energy & Environmental Protection ("DEEP") was submitted to DEEP on November 24, 2015. As of the date of this submission, Petitioner has not received a response from DEEP. Upon receipt of the NDDB Determination Letter, Petitioner will amend its Petition to include a copy of the letter in Exhibit H.

The ESA did not recognize any species or habitat of concern. The site was also investigated for wetlands features; those results can be found in the Wetlands Report (Exhibit F). Some Wetlands features were identified (and subsequently delineated) onsite, and these will be discussed in more detail in section VI.G, below and in the Wetland Report. As it relates to species and habitat, the Facilities footprint was designed to avoid the delineated wetlands features entirely, including a 100-foot buffer around those features. This is shown in detail in Exhibit A. The Petitioner submitted a request to DEEP for NDDB review of the Property and Project footprint on November 24, 2015. Petitioner followed up with DEEP on numerous occasions between the date the review was requested and the date of this submission, yet Petitioner was not able to receive an NDDB determination. Petitioner elected to submit this Petition for Declaratory Ruling despite the lack of the NDDB determination because time is of the essence for this project. Petitioner will provide the Siting Council with the NDDB determination letter from DEEP immediately upon receipt.

G. Water Resources and Storm Water Management.

The Facilities are not anticipated to have an adverse impact to the water resources of the state. The Facilities fixed panel solar arrays can be considered pervious groundcover. The racking provides adequate height above the ground to promote vegetative growth underneath the solar array and allow for infiltration to continue to occur. Natural drainage patterns and vegetal cover will be preserved throughout the project footprint by minimizing ground disturbances. Grading activities for the Facilities have been minimized to the access roadway and utility trenching. All graded areas will be seeded to a low growth low maintenance meadow/native grass condition. Hydraulic modeling calculations illustrate a reduction in downstream flow rates from the Facilities and can be reviewed in the Facilities Stormwater Management Report (Exhibit H).

Construction of the Facilities will result in a grading disturbance of approximately 1.18 acres of land for gravel access roads, structural posts and equipment pads In addition, Petitioner is proposing to impact 0.28 acres of wetlands for access roads to reach the portions of the Facilities that are landlocked. Petitioner will apply for wetland permit with the Army Corp of Engineer, as well as the town of Plainfield Conservation Commission if necessary. The Petitioner will also register under the DEEP's General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities at least thirty (30) days prior to commencing any construction activities. Petitioner intends to request coverage under the existing Connecticut General Permit, DEP-PED-GP-015, by submitting a complete and accurate General Permit Registration Form and Transmittal prior to construction activities and in accordance with applicable rules at the time of filing. In connection with that registration,

Petitioner will implement a storm water management plan to minimize any potential adverse environmental effects.

VII. ADDITIONAL INFORMATION

The Council has previously reviewed petitions for other solar facilities similar to the ones being proposed by the Petitioner. In these other dockets, the Council has sent out interrogatory requests with multiple questions about each facility. This section will attempt to pre-emptively answer some of those questions that were not addressed in previous sections of this petition.

Q01. Did the Petitioner publish a legal notice of its intent to file this petition?

A01. Yes. A copy of the following text ran in the Notices section of the Monday, March 14, 2016 edition of the Hartford Courant:

> "Windham Solar LLC is providing notice to the general public regarding its intent to file a Petition of Declaratory Ruling (Petition) to the Connecticut Siting Council for the proposed development of two (2) – 1.0 megawatt and one (1) – 1.5 megawatt solar photovoltaic renewable energy generating facilities to be located at 91 Plainfield Pike Road in the Town of Plainfield. This notice is being given pursuant to Section 16-50(l) of the Connecticut General Statues. The Petition will be submitted on or after March 15, 2016. Copies of the Petition will be available at the Connecticut Siting Council: Ten Franklin Square, New Britain, CT 06501 or at the Town Hall of the Town of Plainfield."

Q02. How did the Petitioner become aware of the Site?

A02. The Site was actively being listed for sale at the time that the Petitioner was searching for an acceptable location for the Facilites.

Q03. Did the Petitioner investigate any other properties as potential locations for the Facilities? If so, identify these properties.

A03. The Petitioner investigated a large number of properties that were listed for sale. The Site was selected based upon favorable characteristics.

Q04. Has the Petitioner conducted a shading analysis of the Site? If so, provide the results.

A04. No, a shading analysis was not required because the construction plans for the Facilities do not propose and shading objects to be left within the boundaries of the solar array.

Q05. What is the efficiency of the photovoltaic module technology that would be employed by the Petitioner at the proposed project? Does this efficiency decrease over time?

A05. The efficiency will be in the range of 15 to 18 percent, depending on the manufacturer and model of solar module selected for construction. The efficiency does decrease over time, at a predicted average rate of 0.5% per year.

Q06. Would the angles of the Facilities' solar modules be adjusted during the year to maintain optimal alignment with the sun's changing path?

A06. No. The solar modules will be installed on a fixed-tilt racking system.

Q07. Approximately what percentage of the proposed project's maximum possible output would occur during those times of the year when Connecticut normally experiences its peak demand for electricity?

A07. Energize Connecticut (www.energizect.com) defines the peak electricity demand in Connecticut as occurring weekdays between noon and 8 pm, during the summer months of June through September. The Facilities will create approximately 14% of their total annual output during this timeframe.

Q08. Does the Petitioner have contracts to sell the electricity it expects to generate with the proposed Facilities?

A08. Yes, with Eversource under the state's Zero Emission Renewable Energy Credits and Low Emission Renewable Energy Credits programs.

Q09. Has the Petitioner determined if any trees need to be removed to construct the Facilities? If so, how many trees will be removed?

A09. Details of proposed tree removals can be found on sheets 4 and 5 of Exhibit A.

Q10. Are the Facilities located near any Important Bird Areas designated by the Connecticut Audubon Society?

A10. No.

Q11. What would be the construction timeline of the Facilities from groundbreaking to full operation?

A11. Approximately 5 months.

Q12. Describe how the project would be decommissioned at the end of its useful life.

A12. A decommissioning memo is included as Exhibit I.

Q13. Describe the land use within a 0.5 mile radius of the Site.

A13. Uncleared vacant land, commercial, light agriculture, and residential.

VIII. CONCLUSION

The Facilities will provide numerous and significant benefits to the Town of Plainfield, the State of Connecticut and its citizens, while producing significant environmental benefits with minimal environmental impact. Pursuant to CGS § 16-50k(a), the Siting Council shall approve by declaratory ruling the construction or location of customer side distributed resources project or facility with a capacity of not more than sixty-five (65) MW, as long as such project meets DEEP air and water quality standards. The Facilities meet these criteria. Each Facility is a customer-side distributed resources facility "grid-side distributed resources" facility, as defined

in CGS § 16-1(a)(40), because the Project involves "the generation of electricity from a unit with a rating of not more than sixty-five megawatts on the premises of a retail end user within the transmission and distribution system including, but not limited to . . .photovoltaic systems and, as demonstrated herein, each Facility will meet DEEP air and water quality standards. The Facilities will not produce air emissions, will not utilize water to produce electricity, were designed to minimize wetland impacts, will employ a stormwater management plan that will result in no net increase in runoff to any surrounding properties, and furthers the State's energy policy by developing and utilizing renewable energy resources and distributed energy resources. In addition, as demonstrated above, the Facilities will not have a substantial adverse environmental effect in the State of Connecticut.

Accordingly, Petitioner respectfully requests that the Siting Council approve the location, construction and operation of the Facilities by declaratory ruling.

Respectfully Submitted,
Windham Solar LLC

By:_____

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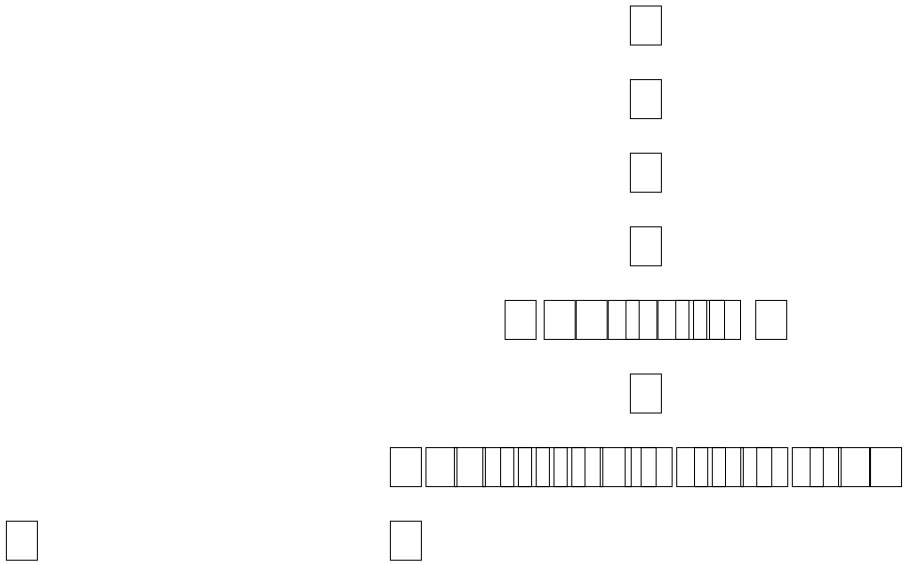


PLAINFIELD PIKE SOLAR
CONNECTICUT SITING BOARD DOCUMENTS

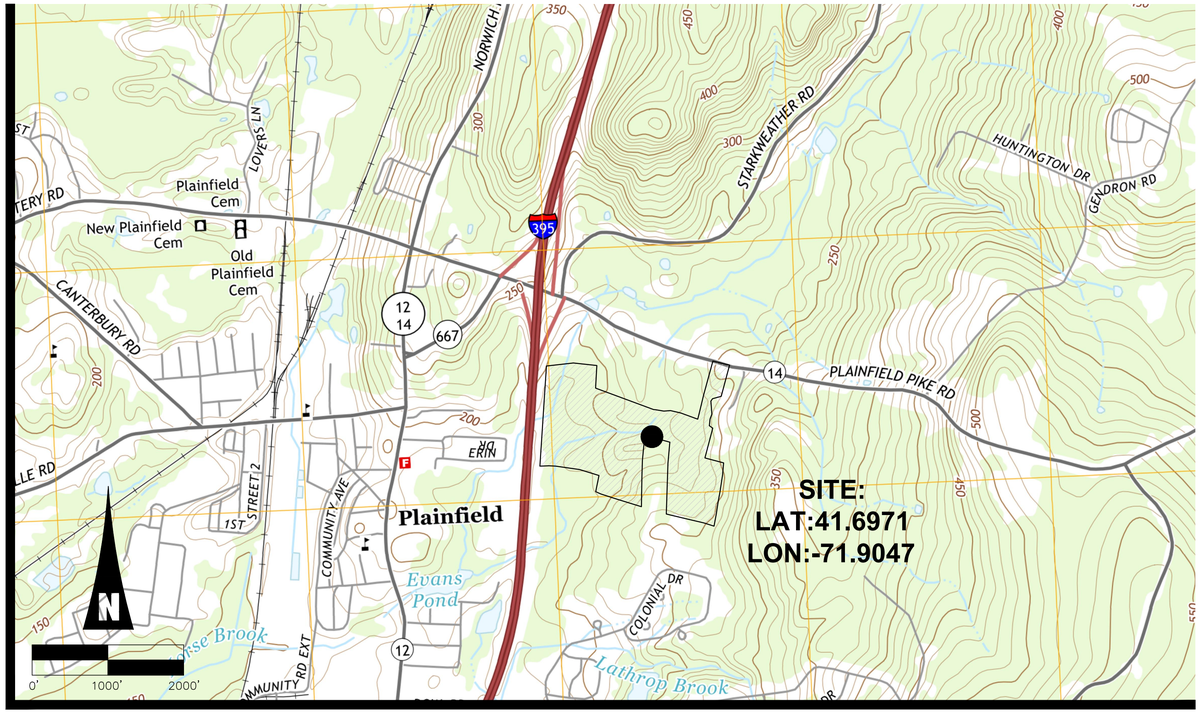
FOR

Site/Electrical Layout, Grading/Drainage/Erosion Control/Landscaping

IN

PLAINFIELD, CONNECTICUT

LOCATION MAP



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FILLED CIRCLE INDICATES DRAWING INCLUDED WITHIN THIS ISSUE
MOST RECENT REVISION NUMBER
MOST RECENT ISSUE OR REVISION DATE

○	-	X/XX/201X	X	SHEET TITLE

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Designed: ADC
Checked: SAW
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Record Drawing by/date:

Revisions:

#	DATE	DESCRIPTION
-	3/15/2016	CT SITING BOARD SUBMISSION

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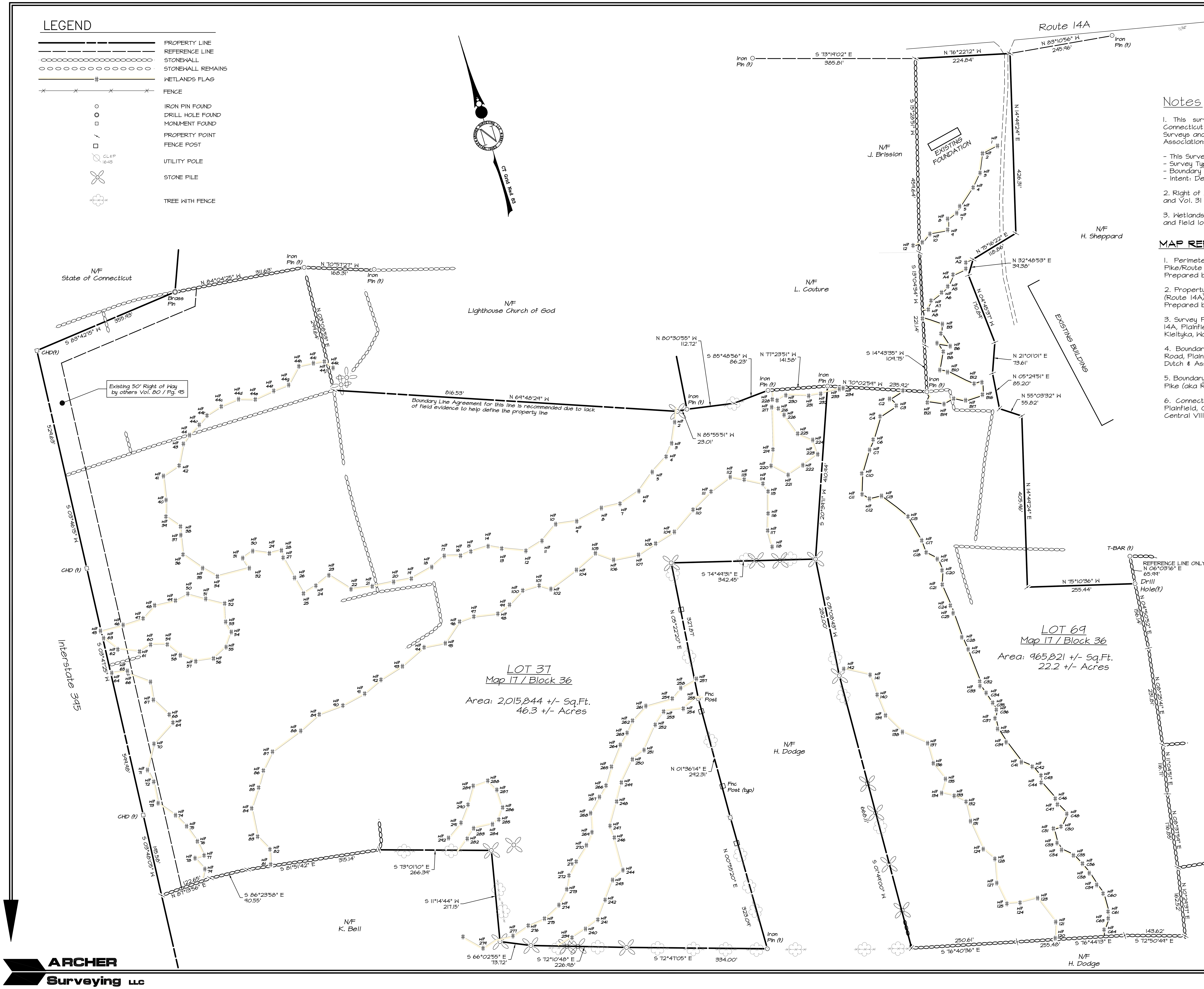
COVER SHEET

SITING BOARD REVIEW

DATE: 03/15/2016
SHEET: 1 of 17



Notes

1. This survey has been prepared pursuant to the Regulations of Connecticut State Agencies Section 20-300b-20 and the "Standards for Surveys and Maps in State of Connecticut" as adopted by the Connecticut Associations of Land Surveyors, Inc. on September 26, 1996

- This Survey conforms to a Class "A-2" Horizontal Accuracy
- Survey Type: Perimeter Survey
- Boundary Determination: Resurvey
- Intent: Depict Existing Conditions with Respect to Property Lines

2. Right of Ways exist of Parcels as stated in deeds Vol. 80 / Pg. 95 and Vol. 31 / Pg 245

3. Wetlands were delineated in the field by Joseph Theroux & John Ianni and field located by Archer Surveying LLC.

MAP REFERENCE:

1. Perimeter Survey Prepared for Sheppard/Steuer Trust. Plainfield Pike/Route 14A, Plainfield, Connecticut, Scale: 1"=100', Dated: May 2015, Prepared by Archer Surveying LLC

2. Property Survey Prepared for Leon and Sally Couture, Plainfield Pike (Route 14A), Plainfield, Connecticut, Scale: 1"=40', Date: December 2002, Prepared by: Eric Seltz L.S.

3. Survey Plan, Prepared for Gertrude Sheppard & Colman Steur, Route 14A, Plainfield, Connecticut, Scale: 1"=50' Date: June 1982, Prepared by: Kleltyka, Woodis & Pike

4. Boundary Survey Prepared for Fleet National Bank, Plainfield Pike Road, Plainfield, Connecticut, Scale: 1"=40', Date: Feb. 1997. Prepared by: Dutch & Associates

5. Boundary Survey, Prepared for Rex Project Management, Inc. Plainfield Pike (aka Rte 14A) Plainfield, Connecticut, Prepared by Fuss & O'Neill Inc

6. Connecticut State Highway Department, Right of Way Map, Town of Plainfield, Connecticut Turnpike, From Lathrop Road Northeasterly to the Central Village-Moosup, Project # 108-19

To My Knowledge and Belief this Map is substantially Correct as noted hereon.

Paul M. Archer LLS #70013 Date

No Certification is expressed or implied unless this map bears the embossed seal of the land surveyor whose signature appears hereon.

Perimeter Survey

Prepared For:

ECOS Renewable Energy

Plainfield Pike / Route 14A

Plainfield, Connecticut

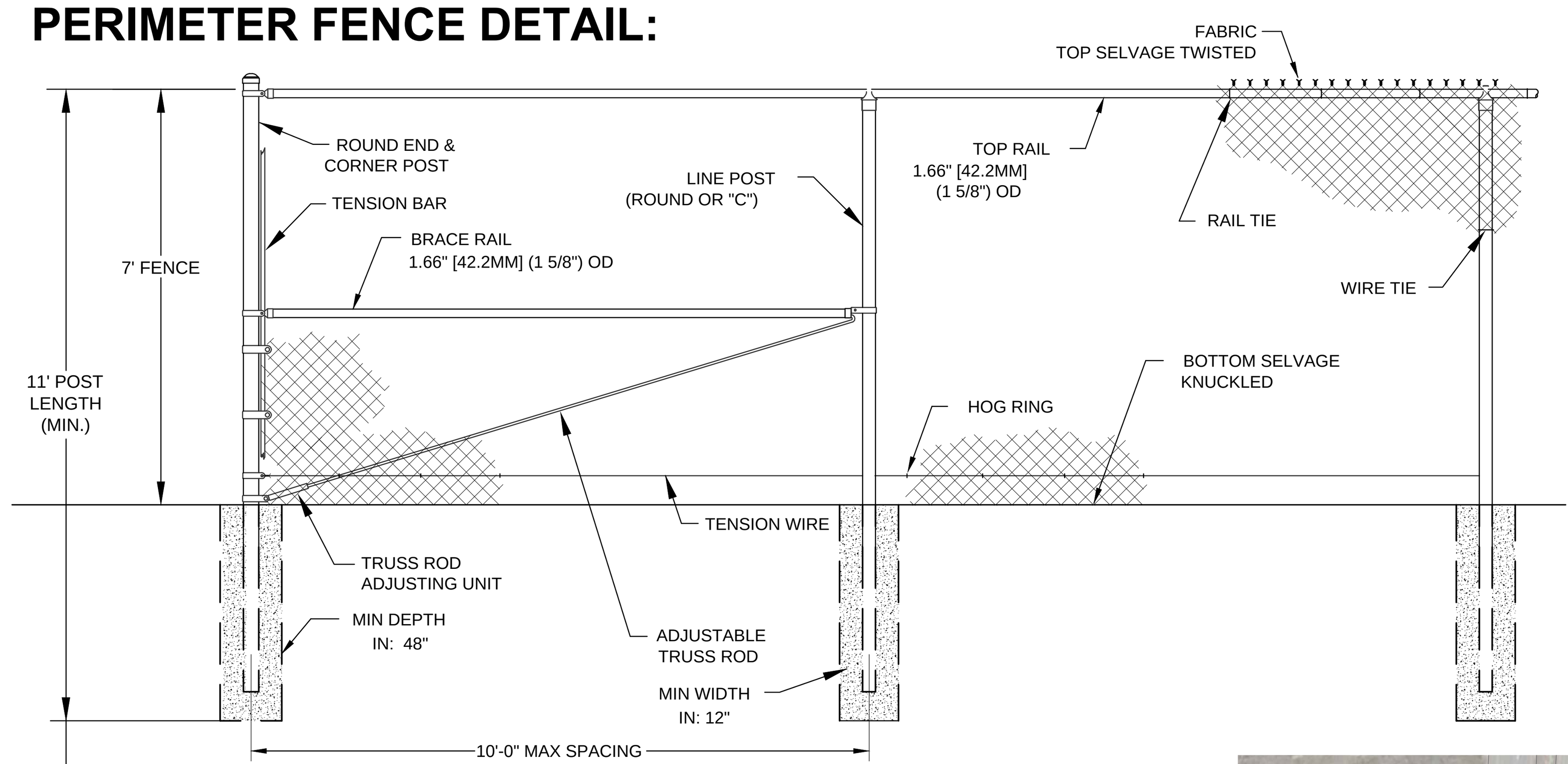
DRAWING SCALE: 1"=100' 0 100 200

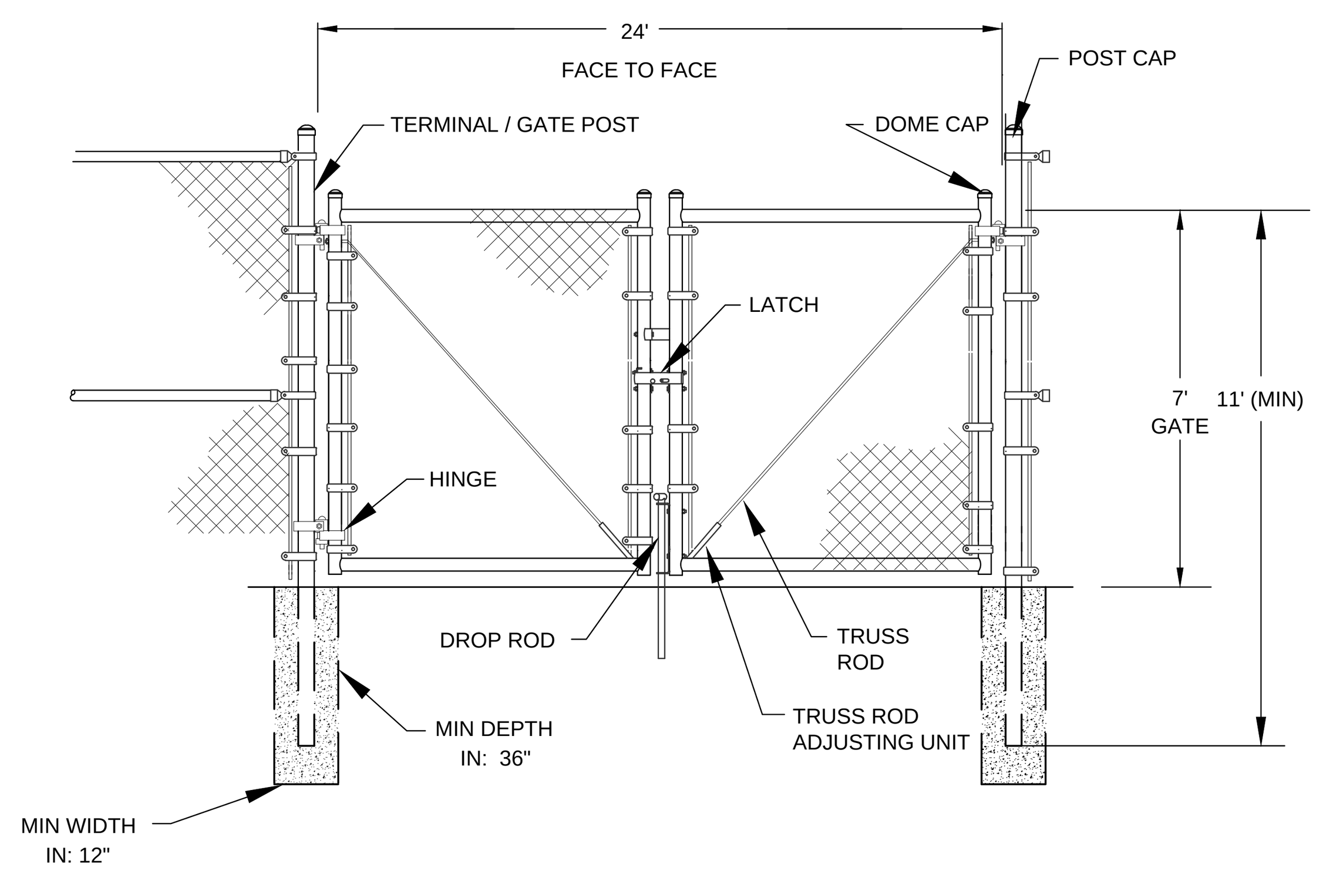
ARCHER Surveying LLC
18 Providence Road, Brooklyn, CT
(860) 779-2240

Sheet No.	1 OF 1	Project No.	1306	Date:	November 2015

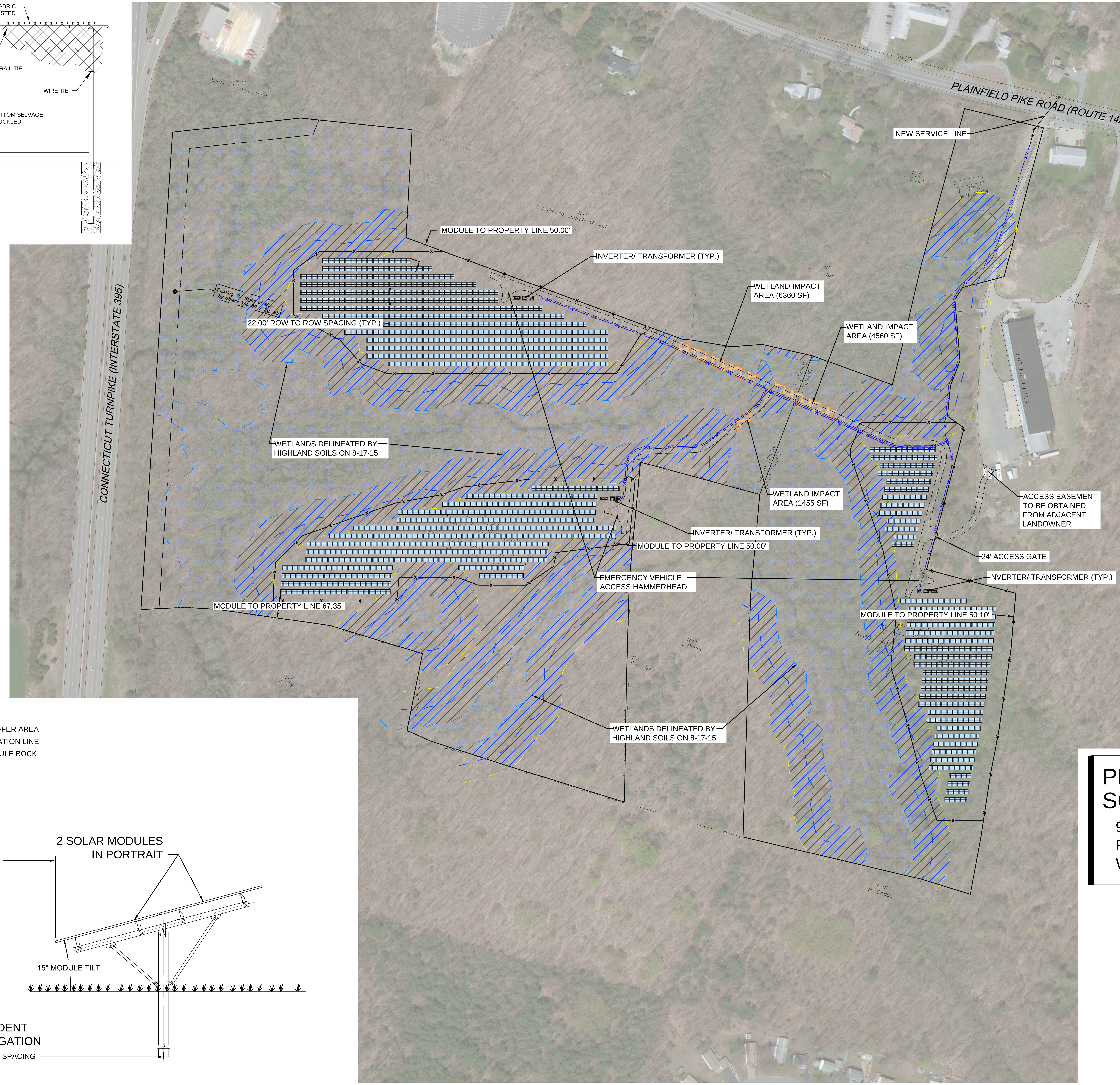
ARCHER Surveying LLC

PERIMETER FENCE DETAIL:





AERIAL SITE PLAN:



PROJECT AREAS & IMPACTS:

TOTAL SITE AREA = 67.2 ACRES

ARRAY FOOTPRINT= 16.9 ACRES (PROJECT FENCELINE LIMITS)

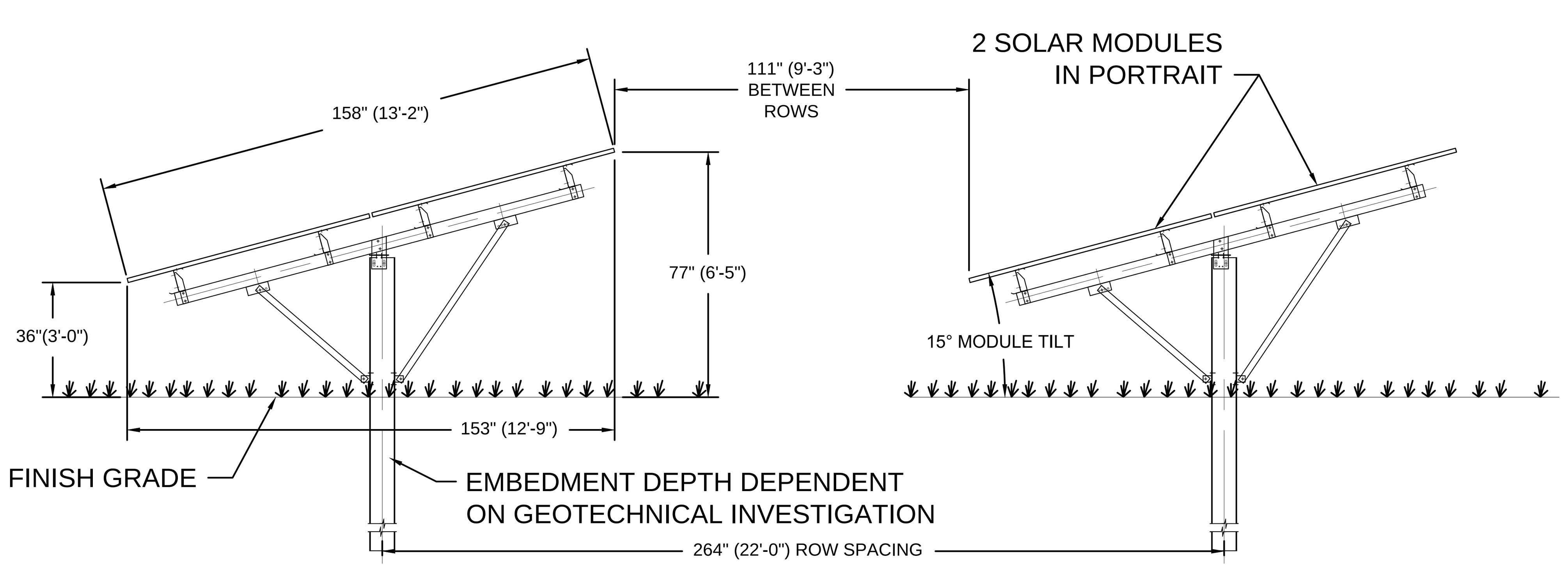
PROPOSED IMPERVIOUS:
GRAVEL ACCESS ROAD, STRUCTURAL POSTS & EQUIPMENT PADS = 1.18 ACRES

PROPOSED WETLAND IMPACTS:
0.24 ACRES FOR PROJECT ACCESS ROADWAYS
*ROADWAYS PROPOSED TO BE AT EXISTING GRADE IN WETLAND IMPACT AREAS TO MAINTAIN NATURAL DRAINAGE DIRECTIONS)

LEGEND:

———	EXISTING PROPERTY LINE
——x——	PROPOSED PROJECT FENCE
— — — —	PROPOSED GRAVEL ACCESS ROAD
——M/V——	PROPOSED AC DISTRIBUTION
/ / / /	100' WETLAND BUFFER AREA
—·—·—	WETLAND DELINEATION LINE
▦	18 x 2 SOLAR MODULE BOCK

RACKING PROFILE DETAIL:



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Westwood Professional Services, Inc.

STATE OF CONNECTICUT
AUGUST D. CHRISTENSEN
0030668
LICENSED
PROFESSIONAL ENGINEER

Designed: ADC

Checked: SAW

Drawn: SJB

Record Drawing by/date:

Revisions:

#	DATE	DESCRIPTION
-	3/15/2016	CT SITING BOARD SUBMISSION

Prepared for:

ecos ENERGY
222 SOUTH 9TH STREET
SUITE 1600
MINNEAPOLIS, MN 55402

0' 150' 300' 450'

PLAINFIELD PIKE SOLAR

91 PLAINFIELD PIKE RD
PLAINFIELD, CT 06374
WINDHAM COUNTY

OVERALL SITE PLAN

SITING BOARD REVIEW

DATE: 03/15/2016

SHEET: 3 of 17

LEGEND:

- EXISTING PROPERTY LINE
- PROPOSED PROJECT FENCE
- PROPOSED GRAVEL ACCESS ROAD
- 14 x 2 SOLAR MODULE BOCK
- 100' WETLAND BUFFER AREA
- WETLAND DELINEATION LINE/AREA
- PROPOSED SILT FENCE
- 100' WETLAND BUFFER CLEARING AREA
- SITE CLEARING AREA

CONSTRUCTION SEQUENCING NOTES:

1. THE CONTRACTOR SHALL PERFORM ALL TREE REMOVAL ACTIVITIES ON SITE TO ALLOW FOR BMP INSTALLATION, NO GRUBBING IS TO OCCUR DURING TREE REMOVAL, PRIOR TO BMP INSTALLATION.
2. ALL BMP'S IDENTIFIED ON THE PLAN SHALL BE STAKED BY A REGISTERED SURVEYOR AND INSTALLED PER PLANS PRIOR TO ANY CONSTRUCTION ACTIVITY.
3. AS-BUILT DRAWINGS SHALL BE MAINTAINED BY THE CONTRACTOR THROUGHOUT THE CONSTRUCTION OF THE PROJECT.

PROJECT FOOTPRINT REMOVAL NOTES

AREAS WITHIN THE PROJECT FENCELINE LIMITS SHALL BE CLEARED BY THE FOLLOWING METHODS:

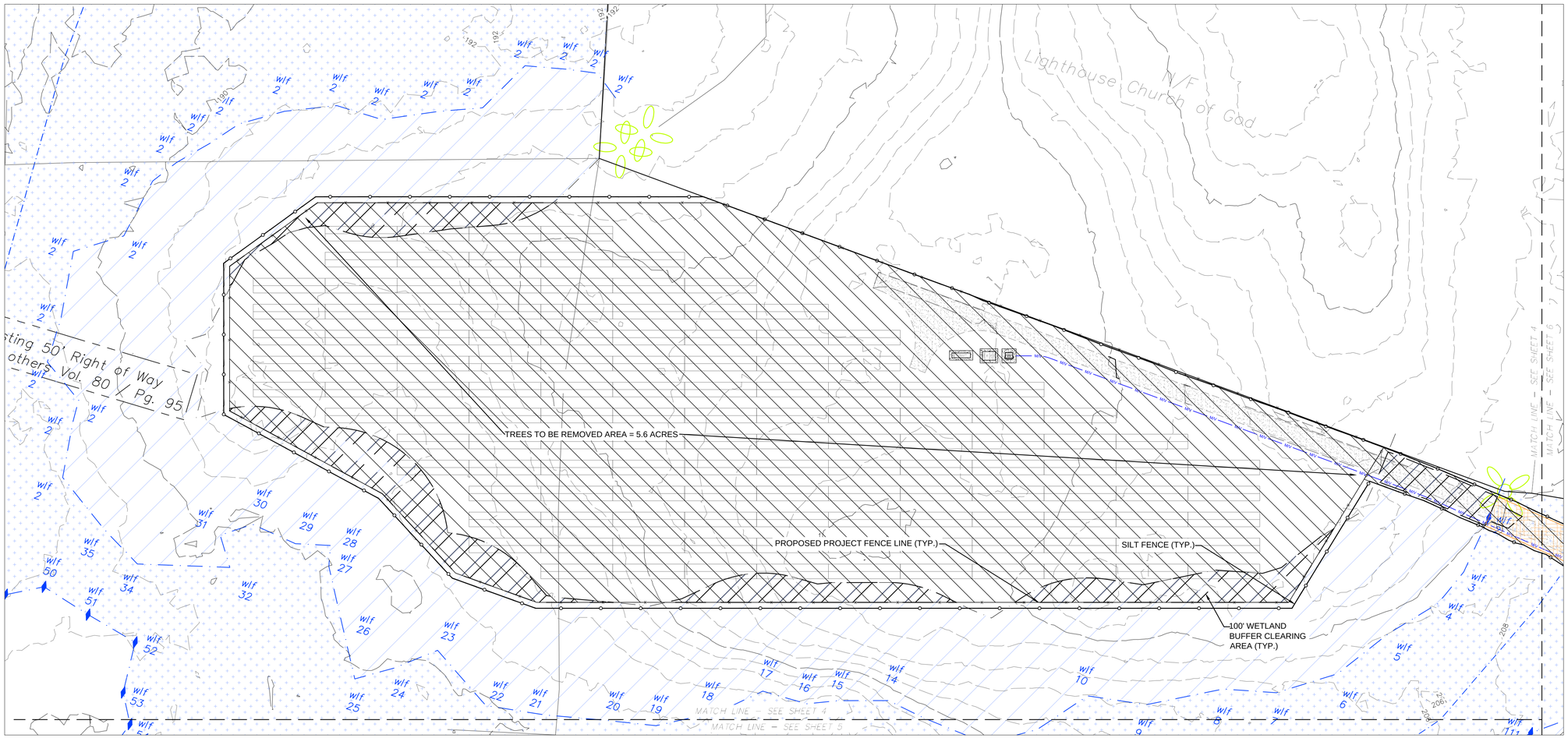
OPEN FIELD AREAS (0.0 ACRES):
1. PRIOR TO CONSTRUCTION VEGETATION SHALL BE CUT AT 6" IN HEIGHT

BRUSH FIELD (0.0 ACRES):
1. BRUSH AND LOW GROWTH VEGETATION SHALL BE CUT AT 6" IN HEIGHT
2. TREES AND VEGETATION LESS THAN 4" IN DIAMETER SHALL BE REMOVED

TREE CANOPY AREAS (18.4 ACRES):
1. TREES AND VEGETATION LESS THAN 4" IN DIAMETER SHALL BE REMOVED
2. TREES GREATER THAN 4" IN DIAMETER SHALL BE CUT AT EXISTING GRADE
3. STUMPS GREATER THAN 4" IN DIAMETER SHALL BE REMOVED IN THE FOLLOWING LOCATIONS:
   - 3.1. AREAS ILLUSTRATED IN GRADING LIMITS
   - 3.2. INVERTER / EQUIPMENT SKID
   - 3.3. 3' DIAMETER EACH ARRAY PIER
   - 3.4. ALL TRENCHING LOCATIONS (MAY OCCUR DURING TRENCHING OPERATIONS)
4. TREE REMOVAL IN WETLAND BUFFER AREA (3.30 ACRES)

EROSION CONTROL NOTES:

1. TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED BEFORE ANY SOIL DISTURBANCE.
2. THE AREA OF DISTURBANCE SHALL BE KEPT TO A MINIMUM. DISTURBED AREAS REMAINING IDLE FOR MORE THAN 14 DAYS SHALL BE STABILIZED.
3. MEASURES SHALL BE TAKEN TO CONTROL EROSION WITHIN THE PROJECT AREA. SEDIMENT IN RUNOFF WATER SHALL BE TRAPPED AND RETAINED WITHIN THE PROJECT AREA USING APPROVED MEASURES.
4. WETLAND AREAS AND SURFACE AREAS SHALL BE PROTECTED FROM SEDIMENT. OFF-SITE SURFACE WATER AND RUNOFF FROM UNDISTURBED AREAS SHALL BE DIVERTED AWAY FROM DISTURBED AREAS WHERE FEASIBLE OR CARRIED THROUGH THE PROJECT AREA WITHOUT CAUSING EROSION. INTEGRITY OF DOWNSTREAM DRAINAGE SYSTEMS SHALL BE MAINTAINED.
5. ALL TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE REMOVED AFTER FINAL SITE STABILIZATION. STABILIZATION MEASURES SUCH AS HYDROSEEDING OR APPLICATION OF HAY/MULCH OR SOIL NETTING SHALL BE APPLIED PRIOR TO REMOVAL OF TEMPORARY EROSION MEASURES AND INSPECTED WEEKLY UNTIL STABILIZATION IS COMPLETE. TEMPORARY EROSION CONTROL MEASURES MAY BE REMOVED ONCE STABILIZATION OF ALL SITE SOILS HAS BEEN ACHIEVED AND WRITTEN AUTHORIZATION TO DO SO HAS BEEN PROVIDED BY THE STORMWATER AUTHORITY. TRAPPED SEDIMENT SHALL BE REMOVED IMMEDIATELY WITH TEMPORARY EROSION CONTROL METHODS AND LAWFULLY DISPOSED OF OFF-SITE. OTHER DISTURBED SOIL AREAS RESULTING FROM THE REMOVAL OF TEMPORARY MEASURES SHALL BE PERMANENTLY STABILIZED WITHIN THIRTY DAYS.
6. DEVELOPER TO OBTAIN AN NPDES PERMIT PRIOR TO CONSTRUCTION.



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STATE OF CONNECTICUT · ROBERT D. CHRIST · 0030668 · LICENSED PROFESSIONAL ENGINEER

Designed:	ADC
Checked:	SAW
Drawn:	SJB
Record Drawing by/date:	

Revisions:

#	DATE	DESCRIPTION
-	3/15/2016	CT SITING BOARD SUBMISSION

Prepared for:

ecos ENERGY
222 SOUTH 9TH STREET
SUITE 1600
MINNEAPOLIS, MN 55402

0' 50' 100' 150'

PLAINFIELD PIKE SOLAR

91 PLAINFIELD PIKE RD
PLAINFIELD, CT 06374
WINDHAM COUNTY

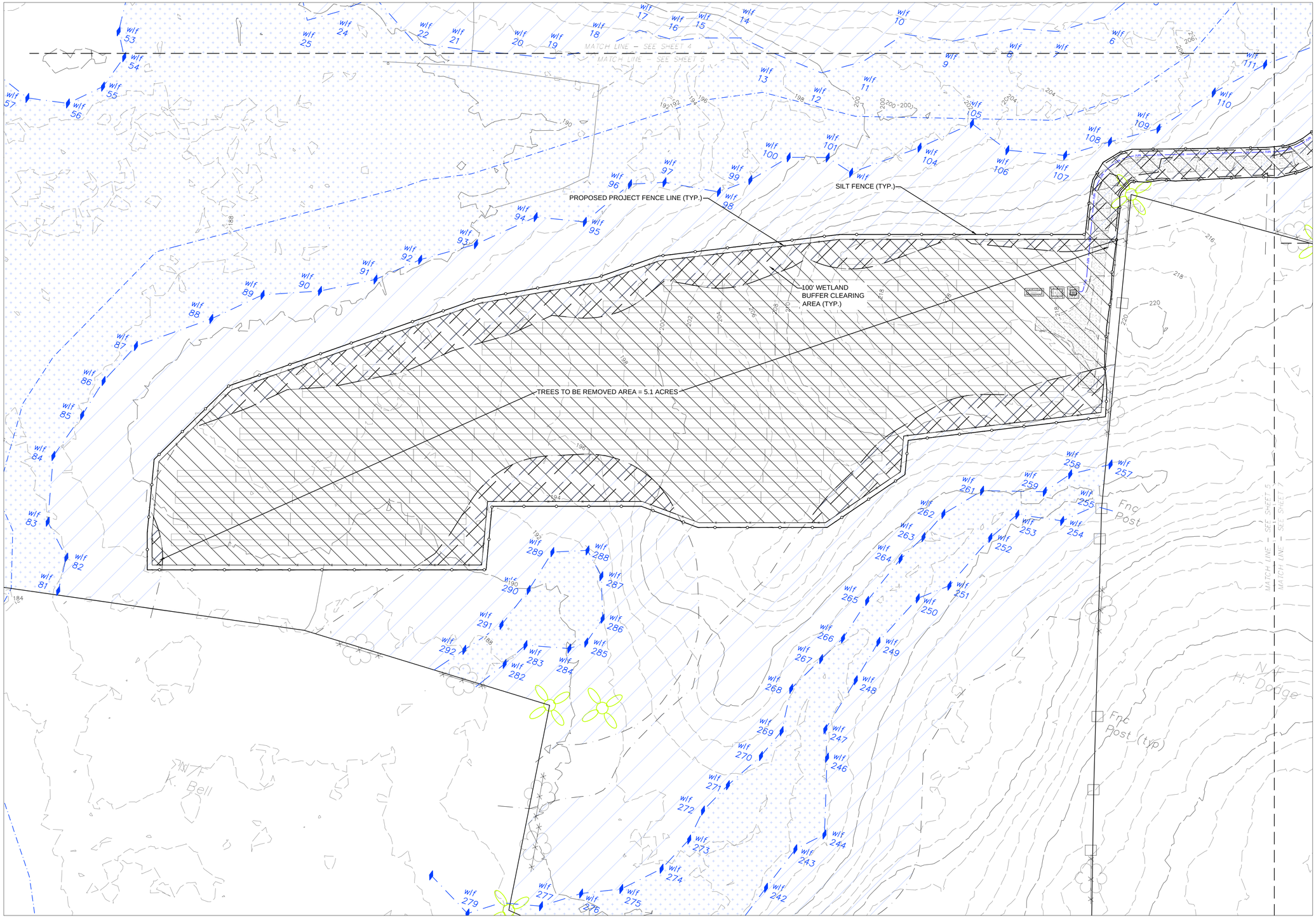
NORTHWEST REMOVAL & EROSION CONTROL PLAN

SITING BOARD REVIEW

DATE: 03/15/2016
SHEET: 4 of 17

NOTES & LEGEND:

SEE SHEET 4



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ROBERT D. CHRISTIE
0030668
LICENSED
PROFESSIONAL ENGINEER

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Revisions:

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Prepared for:

ecos ENERGY
222 SOUTH 9TH STREET
SUITE 1600
MINNEAPOLIS, MN 55402

0' 50' 100' 150'

PLAINFIELD PIKE SOLAR

91 PLAINFIELD PIKE RD
PLAINFIELD, CT 06374
WINDHAM COUNTY

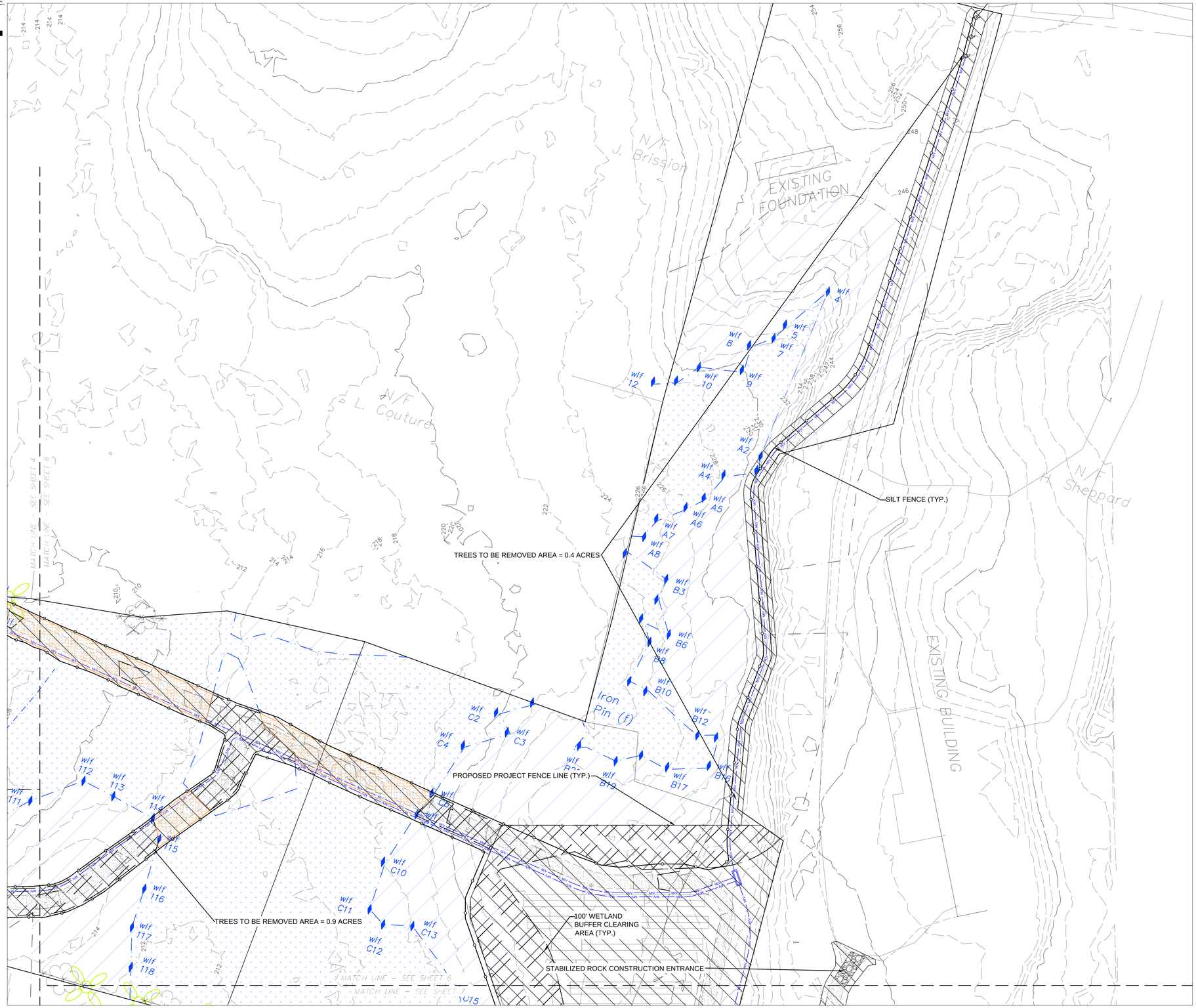
SOUTHWEST REMOVAL & EROSION CONTROL PLAN

SITING BOARD REVIEW

DATE: 03/15/2016
SHEET: 5 of 17

NOTES & LEGEND:

SEE SHEET 4



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-	3/15/2016	CT SITING BOARD SUBMISSION

Prepared for:

ecos ENERGY
222 SOUTH 9TH STREET
SUITE 1600
MINNEAPOLIS, MN 55402

0' 50' 100' 150'

PLAINFIELD PIKE SOLAR

91 PLAINFIELD PIKE RD
PLAINFIELD, CT 06374
WINDHAM COUNTY

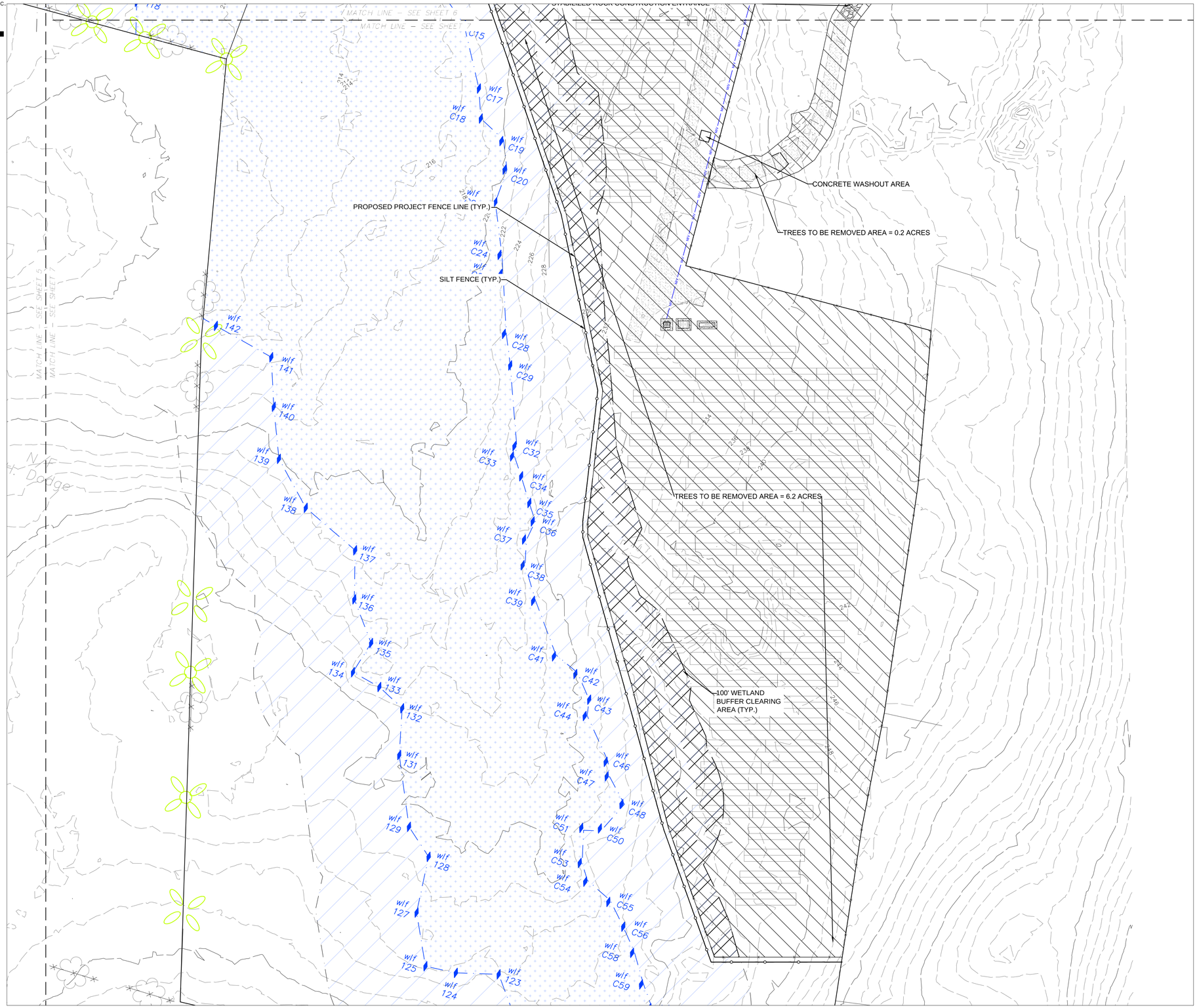
NORTHEAST REMOVAL & EROSION CONTROL PLAN

SITING BOARD REVIEW

DATE: 03/15/2016
SHEET: 6 of 17

NOTES & LEGEND:

SEE SHEET 4



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WINDHAM COUNTY

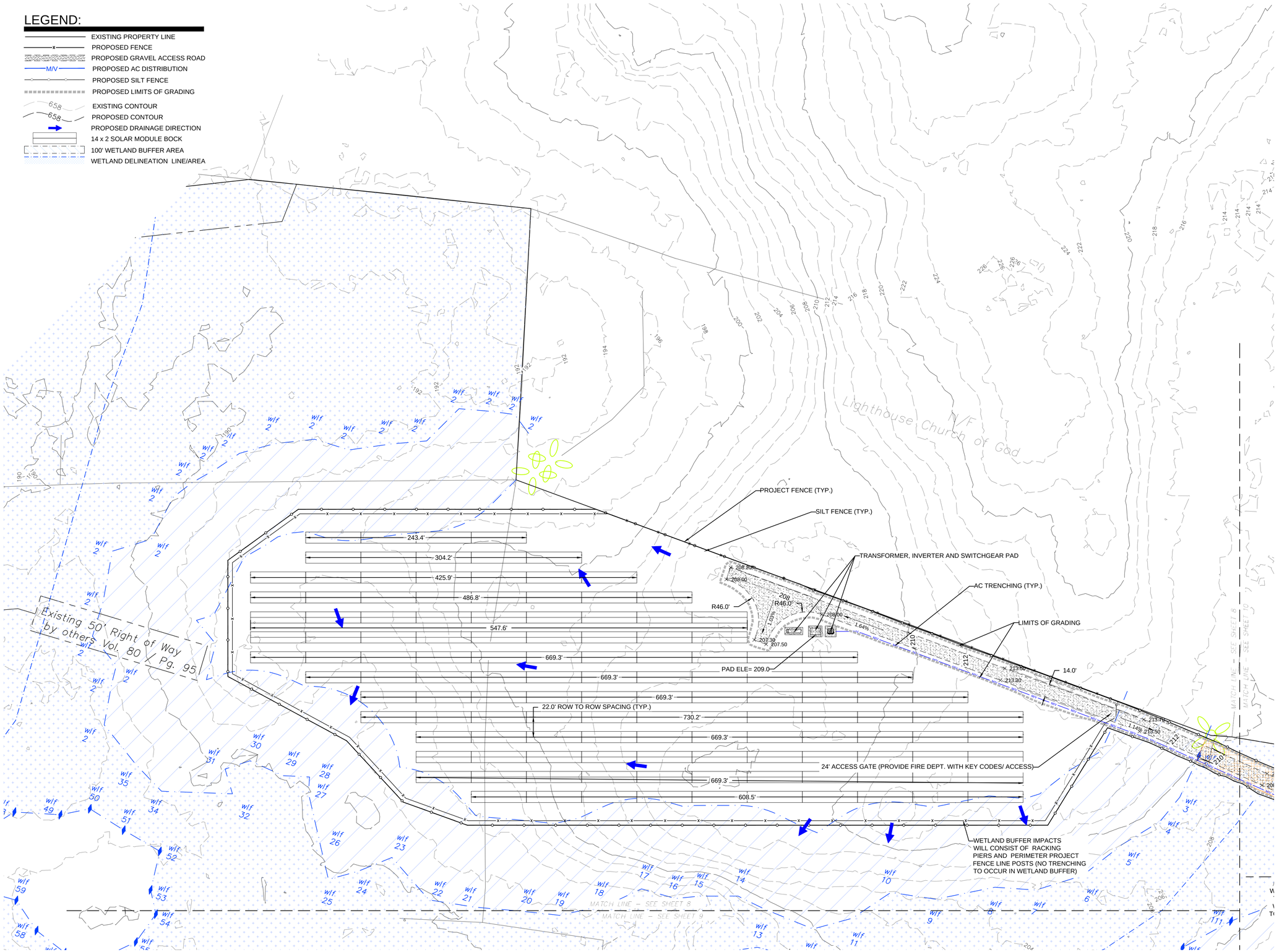
SOUTHEAST REMOVAL & EROSION CONTROL PLAN

SITING BOARD REVIEW

DATE: 03/15/2016
SHEET: 7 of 17

LEGEND:

- EXISTING PROPERTY LINE
- PROPOSED FENCE
- PROPOSED GRAVEL ACCESS ROAD
- M/V — PROPOSED AC DISTRIBUTION
- PROPOSED SILT FENCE
- PROPOSED LIMITS OF GRADING
- 658 — EXISTING CONTOUR
- 658 — PROPOSED CONTOUR
- PROPOSED DRAINAGE DIRECTION
- 14 x 2 SOLAR MODULE BOCK
- 100' WETLAND BUFFER AREA
- WETLAND DELINEATION LINE/AREA



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222 SOUTH 9TH STREET
SUITE 1600
MINNEAPOLIS, MN 55402

0' 50' 100' 150'

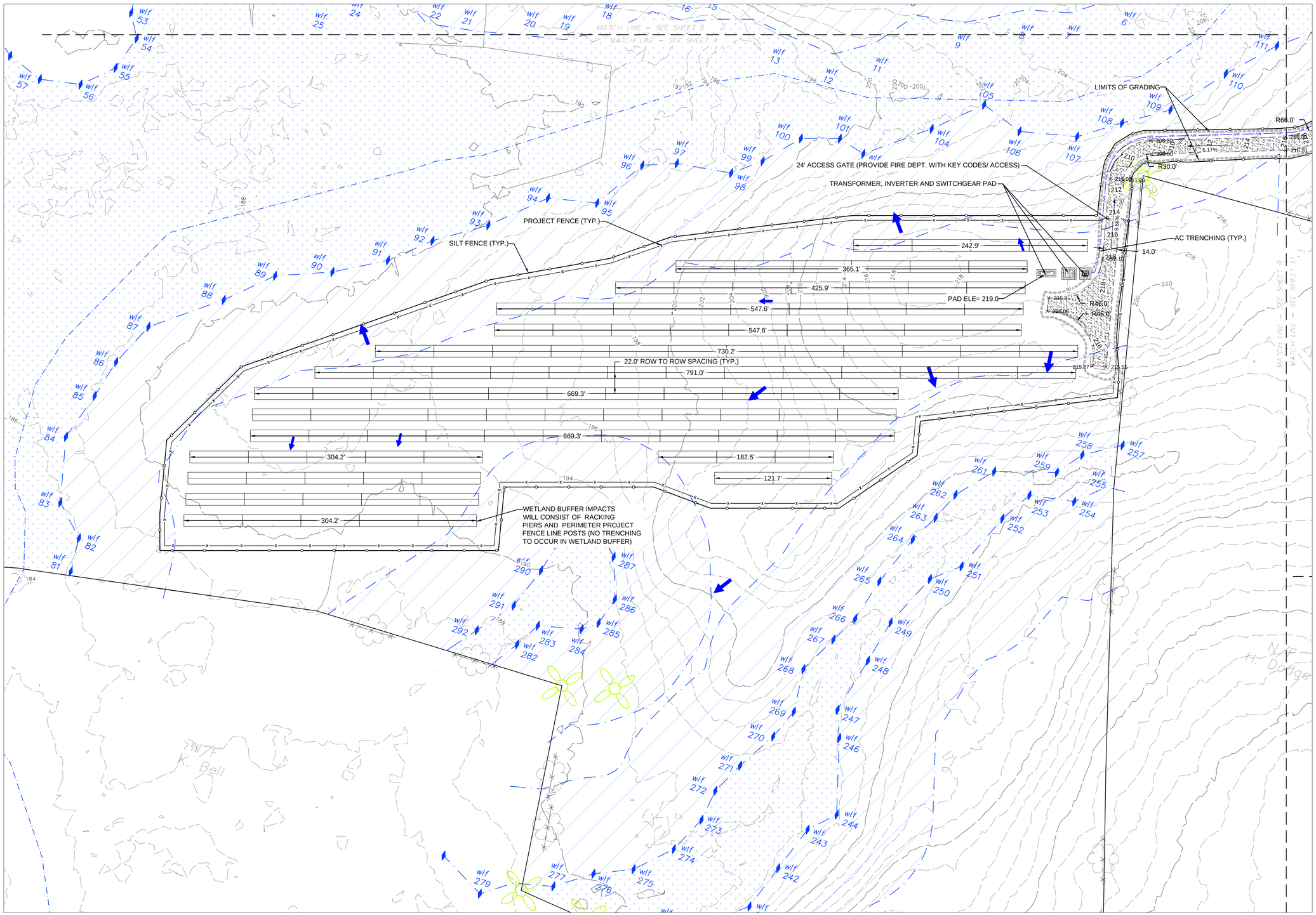
PLAINFIELD PIKE SOLAR

91 PLAINFIELD PIKE RD
PLAINFIELD, CT 06374
WINDHAM COUNTY

NORTHWEST SITE & GRADING PLAN

SITING BOARD REVIEW

DATE: 03/15/2016
SHEET: 8 of 17



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SUITE 1600
MINNEAPOLIS, MN 55402

0' 50' 100' 150'

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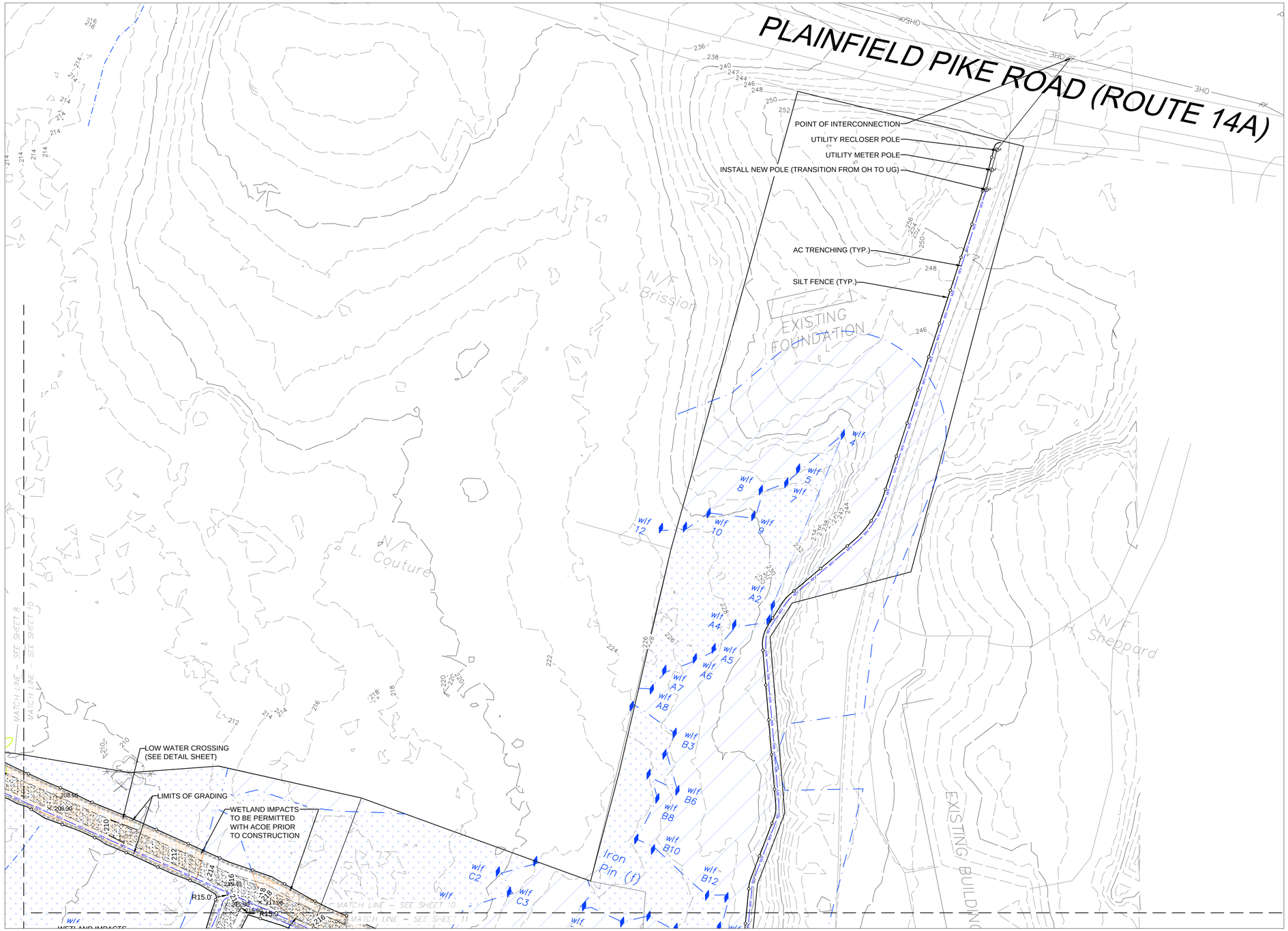
PLAINFIELD, CT 06374
WINDHAM COUNTY

SOUTHWEST SITE/GRADING/ EROSION CONTROL PLAN

SITING BOARD REVIEW

DATE: 03/15/2016
SHEET: 9 of 17



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-	3/15/2016	CT SITING BOARD SUBMISSION

Prepared for:

ecos ENERGY
222 SOUTH 9TH STREET
SUITE 1600
MINNEAPOLIS, MN 55402

N

0' 50' 100' 150'

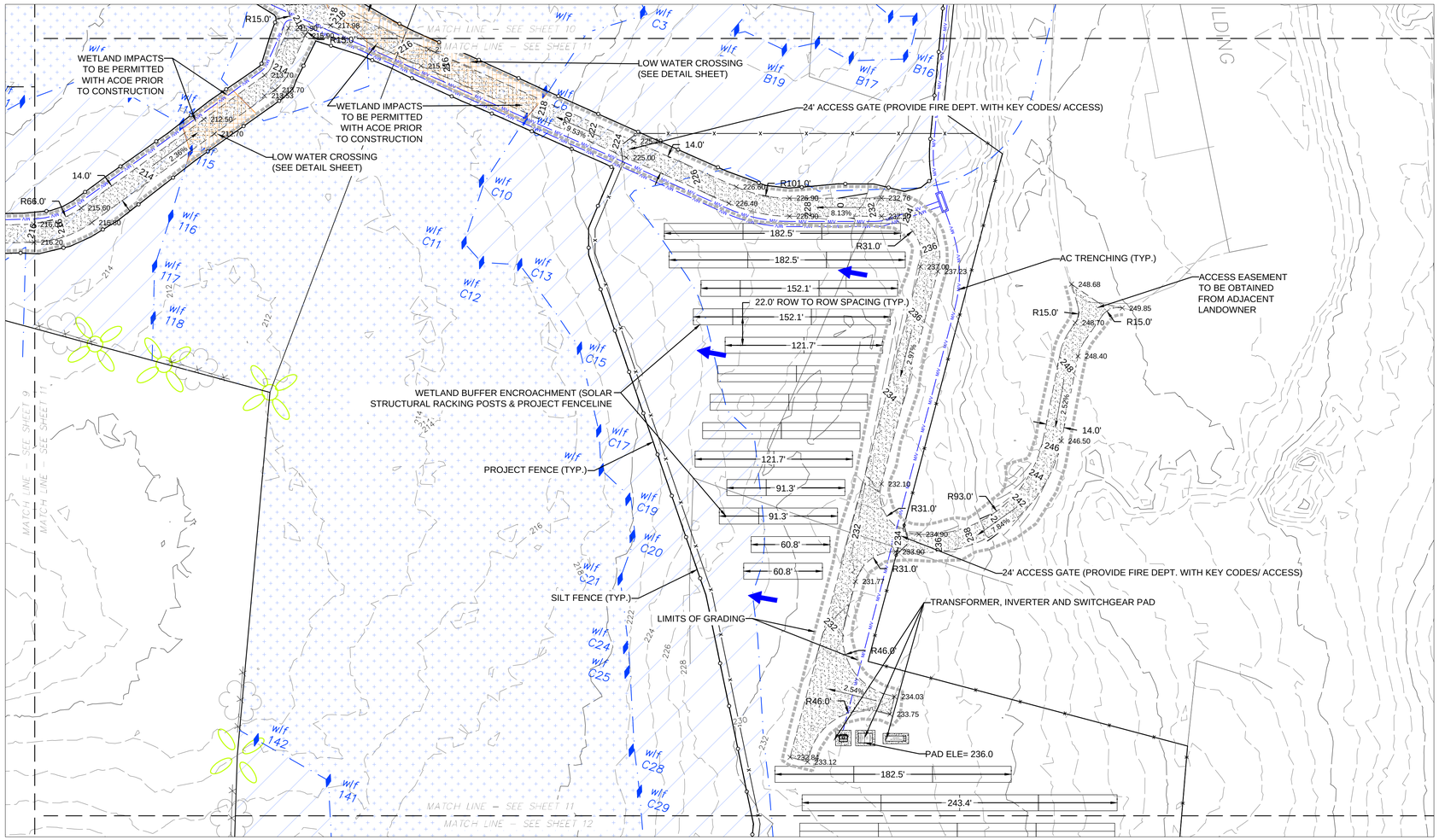
PLAINFIELD PIKE SOLAR

91 PLAINFIELD PIKE RD
PLAINFIELD, CT 06374
WINDHAM COUNTY

NORTHEAST SITE/GRADING/ EROSION CONTROL PLAN

SITING BOARD REVIEW

DATE: 03/15/2016
SHEET: 10 of 17



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-	3/15/2016	CT SITING BOARD SUBMISSION

Prepared for:

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SUITE 1600
MINNEAPOLIS, MN 55402

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PLAINFIELD PIKE SOLAR

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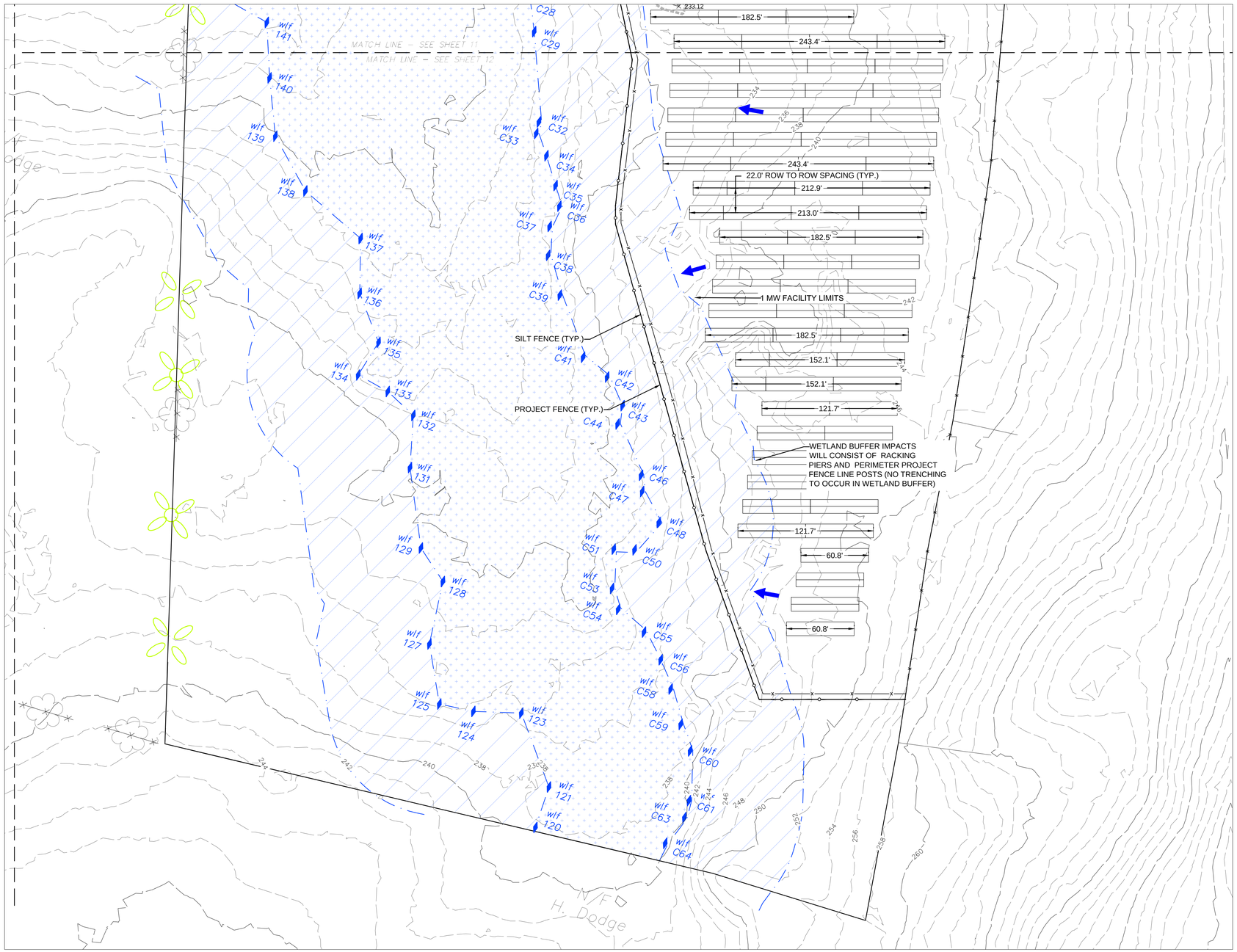
PLAINFIELD, CT 06374
WINDHAM COUNTY

EAST SITE/GRADING/ EROSION CONTROL PLAN

SITING BOARD REVIEW

DATE: 03/15/2016
SHEET: 11 of 17



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MINNEAPOLIS, MN 55402

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0' 50' 100' 150'

PLAINFIELD PIKE SOLAR

91 PLAINFIELD PIKE RD
PLAINFIELD, CT 06374
WINDHAM COUNTY

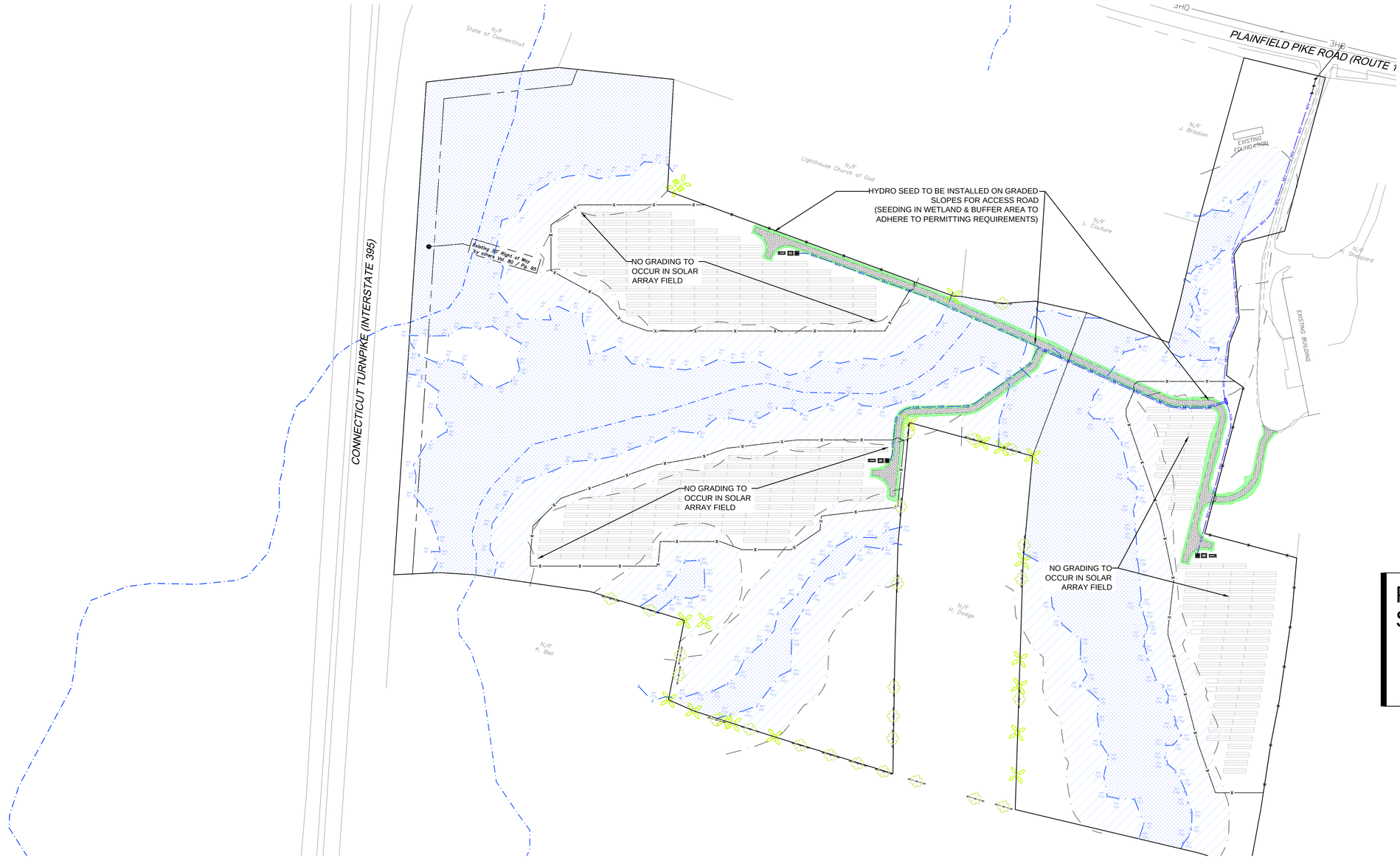
SOUTHEAST SITE/GRADING/ EROSION CONTROL PLAN

SITING BOARD REVIEW

DATE: 03/15/2016
SHEET: 12 of 17

SEEDING NOTES:

1. THE CONTRACTOR SHALLHYDROSEED ALL DISTURBED AREAS ASSOCIATED WITH THE CONSTRUCTION OF THE SOLAR FACILITY. CONTRACTOR SHALL USE AN APPROVED LOW GROWTH LOW MAINTENANCE SEED MIX APPROVED BY THE APPROPRIATE GOVERNING AUTHORITY.



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Westwood Professional Services, Inc.

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Revisions:

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-	3/15/2016	CT SITING BOARD SUBMISSION

Prepared for:

ecos ENERGY
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SUITE 1600
MINNEAPOLIS, MN 55402

PLAINFIELD PIKE SOLAR

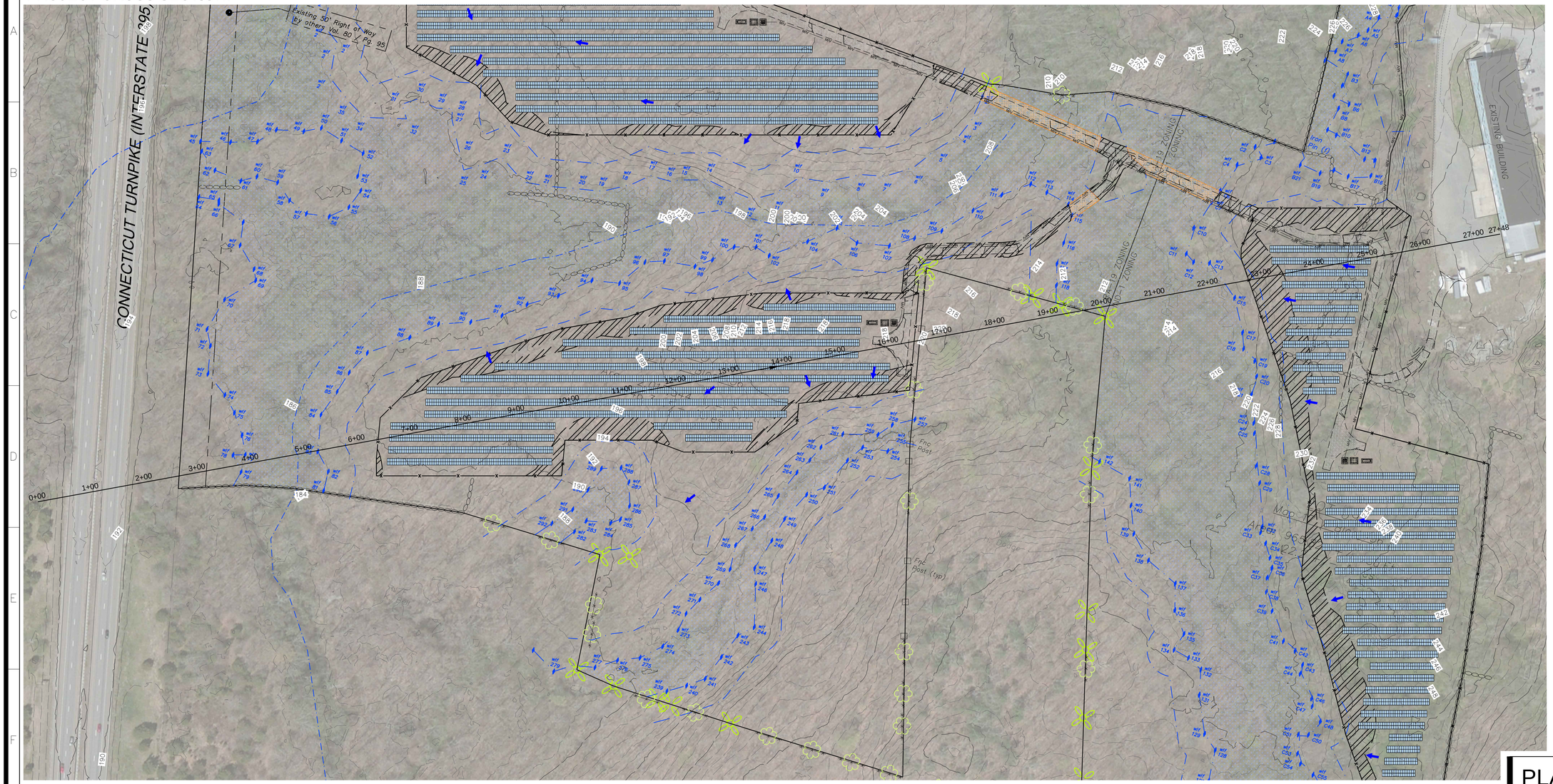
91 PLAINFIELD PIKE RD
PLAINFIELD, CT 06374
WINDHAM COUNTY

LANDSCAPE PLAN

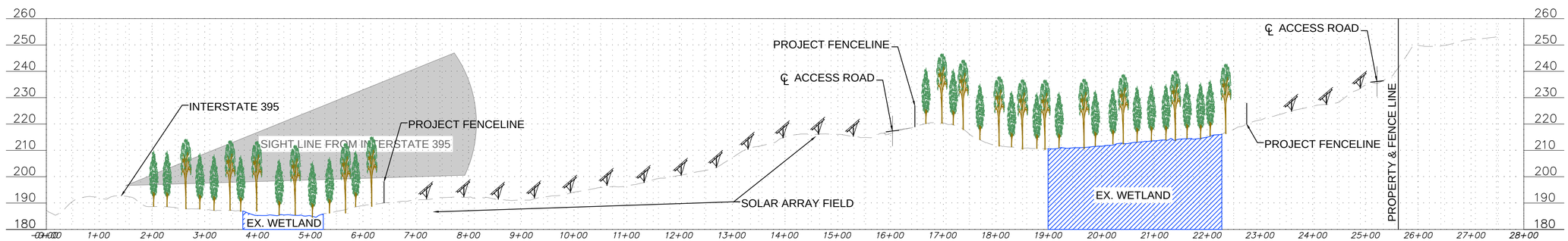
SITING BOARD REVIEW

DATE: 03/15/2016
SHEET: 13 of 17

PROJECT CROSS SECTION:



PROJECT PROFILE:



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Westwood Professional Services, Inc.

STATE OF CONNECTICUT
ROBERT D. CHRISTIE
0030668
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Revisions:

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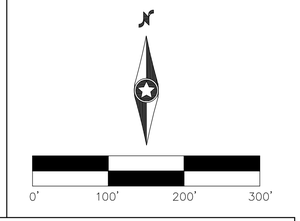
SUITE 1600
MINNEAPOLIS, MN 55402



PLAINFIELD PIKE SOLAR

91 PLAINFIELD PIKE RD
PLAINFIELD, CT 06374
WINDHAM COUNTY

PROJECT CROSS SECTION

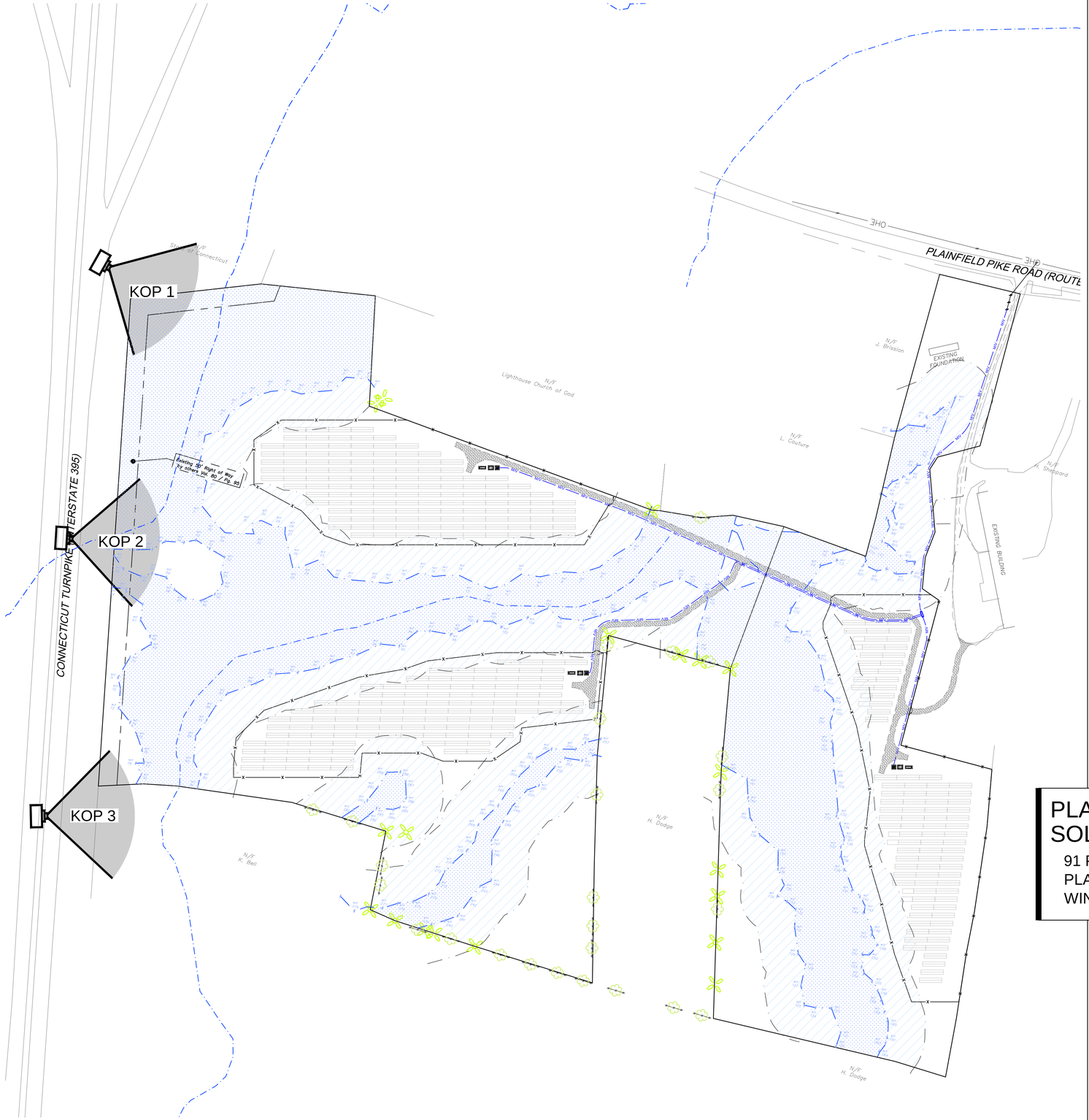
SITING BOARD REVIEW

DATE: 03/15/2016
SHEET: 14 of 17

KOP 1 - 395 LOOKING EAST TOWARDS THE SITE

KOP 2 - 395 LOOKING EAST TOWARDS THE SITE

KOP 3 - 395 LOOKING EAST TOWARDS THE SITE



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Westwood Professional Services, Inc.

STATE OF CONNECTICUT
KRISTI D. CHRISTIAN
0030668
LICENSED
PROFESSIONAL ENGINEER

Designed:	ADC
Checked:	SAW
Drawn:	SJB
Record Drawing by/date:	

Revisions:

#	DATE	DESCRIPTION
-	3/15/2016	CT SITING BOARD SUBMISSION

Prepared for:

ecos ENERGY
222 SOUTH 9TH STREET
SUITE 1600
MINNEAPOLIS, MN 55402

PLAINFIELD PIKE SOLAR

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PLAINFIELD, CT 06374
WINDHAM COUNTY

KEY OBSERVATION POINT PLAN

SITING BOARD REVIEW

DATE: 03/15/2016
SHEET: 15 of 17

ROAD DESIGN PARAMETERS

1. ROAD MAINTENANCE CAN BE EXPECTED OVER THE LIFE OF THE PERMANENT FACILITY.

SPECIAL PROVISIONS FOR GRADING AND EROSION CONTROL

THE CONTRACTOR SHALL PROVIDE EROSION CONTROL MEASURES AS PLANNED AND SPECIFIED FOLLOWING BEST MANAGEMENT PRACTICES AS OUTLINED BY THE STATE OF CONNECTICUT AND BEING IN CONFORMANCE WITH THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL STORMWATER PERMIT. SEE THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR EROSION CONTROL AND RESTORATION SPECIFICATIONS. UNLESS OTHERWISE NOTED OR MODIFIED HEREIN, ALL SECTIONS OF THE GENERAL CONDITIONS SHALL APPLY.

EXECUTION

1. CLEARING AND GRUBBING
   - A. THE CONTRACTOR SHALL BE REQUIRED TO REMOVE ALL TREES, STUMPS, BRUSH, AND DEBRIS WITHIN THE GRADING LIMITS SHOWN ON THE PLANS. THE CONTRACTOR IS TO REMOVE ONLY THOSE TREES WHICH ARE DESIGNATED BY THE OWNER'S REPRESENTATIVE FOR REMOVAL, AND SHALL EXERCISE EXTREME CARE AROUND EXISTING TREES TO BE SAVED.
2. TOPSOIL STRIPPING
   - A. TOPSOIL SHALL BE STRIPPED FROM ALL ROADWAY AREAS THROUGH THE ROOT ZONE. TOPSOIL SHALL NOT BE STRIPPED OUTSIDE OF THE DESIGNATED DISTURBANCE AREAS.
   - B. ANY TOPSOIL, THAT HAS BEEN STRIPPED, SHALL BE RE-SPREAD OR STOCKPILED WITHIN GRADING AREAS AND/OR USED AS FILL OUTSIDE OF THE DISTURBANCE AREAS, AS DIRECTED BY THE ENGINEER.
3. EMBANKMENT CONSTRUCTION.
   - A. EMBANKMENT CONSTRUCTION SHALL CONSIST OF THE PLACING OF SUITABLE FILL MATERIAL, AFTER TOPSOIL STRIPPING, ABOVE THE EXISTING GRADE. GENERALLY, EMBANKMENTS SHALL HAVE COMPACTED SUPPORT SLOPES OF TWO AND A HALF FEET HORIZONTAL TO ONE FOOT VERTICAL. THE MATERIAL FOR EMBANKMENT CONSTRUCTION SHALL BE OBTAINED FROM THE ACCESS ROAD EXCAVATION (SEE GEOTECHNICAL REPORT FOR RESTRICTIONS), OR ANY SUITABLE, APPROVED SOIL OBTAINED OFFSITE BY CONTRACTOR, AS DIRECTED OR APPROVED BY THE ENGINEER. THIS MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 9".
   - B. SIDE SLOPES GREATER THAN 2.5:1 WILL NOT BE PERMITTED, UNLESS OTHERWISE NOTED ON THE PLAN.

TESTING REQUIREMENTS:

1. TESTING SHALL BE PERFORMED BY A DESIGNATED INDEPENDENT TESTING AGENCY.
2. SUBMIT TESTING AND INSPECTION RECORDS SPECIFIED TO THE CIVIL ENGINEER OF RECORD FOR REVIEW.
   - A. THE ENGINEER WILL REVIEW THE TESTING AND INSPECTION RECORDS TO CHECK CONFORMANCE WITH THE DRAWINGS AND SPECIFICATIONS. THE ENGINEER'S REVIEW DOES NOT RELIEVE THE CONSTRUCTION CONTRACTOR FROM THE RESPONSIBILITY FOR CORRECTING DEFECTIVE WORK.
3. PROOF ROLLING:
   - A. PROOF-ROLLING SHALL BE PERFORMED IN THE PRESENCE OF THE GEOTECHNICAL ENGINEER OR QUALIFIED GEOTECHNICAL REPRESENTATIVE USING A FULLY LOADED TANDEM AXLE DUMP TRUCK WITH A MINIMUM GROSS WEIGHT OF 25 TONS OR A FULLY LOADED WATER TRUCK WITH AN EQUIVALENT AXLE LOADING. PROOF-ROLLING ACCEPTANCE STANDARDS INCLUDE NO RUTTING GREATER THAN 1.5 INCHES, AND NO "PUMPING" OF THE SOIL BEHIND THE LOADED TRUCK.
4. SIEVE ANALYSIS:
   - A. SIEVE ANALYSIS SHALL BE CONDUCTED IN ACCORDANCE WITH AASHTO T27
5. PROCTOR:
   - A. PROCTORS SHALL BE DETERMINED IN ACCORDANCE WITH ASTM D-1557
6. ATTERBERG LIMITS:
   - A. ATTERBERG LIMITS SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T89 AND T90
7. MOISTURE DENSITY (NUCLEAR DENSITY):
   - A. MOISTURE DENSITY TESTING SHALL BE DONE IN ACCORDANCE WITH AASHTO T310

SUBGRADE COMPACTION, TEST ROLLING AND AGGREGATE BASE COMPACTION:

1. FILL MATERIAL:
   - A. SOILS USED AS FILL MATERIAL SHALL BE TESTED FOR GRAIN SIZE ANALYSIS, MOISTURE CONTENT, ATTERBERG LIMITS ON FINES CONTENT, AND PROCTOR TESTS (MODIFIED DRY MAXIMUM DENSITY).
     - a. FOR PLACED & COMPACTED FILLS, PROVIDE ONE COMPACTION TEST PER LIFT FOR EVERY 1000 FT OF ROAD LENGTH. INCLUDE THE LOCATION, DRY DENSITY, MOISTURE CONTENT, AND COMPACTION PERCENT BASED ON MODIFIED PROCTOR MAXIMUM DRY DENSITY.
   - B. IN ROADWAY CUT AREAS, OR WHERE EMBANKMENT CONSTRUCTION REQUIRES LESS THAN 12 INCHES OF FILL PLACEMENT, COMPACT TO A MINIMUM OF 95 PERCENT OF THE MATERIAL'S MODIFIED PROCTOR MAXIMUM DRY DENSITY.
2. COMPACTED SUBGRADE:
   - A. THE ENTIRE SUBGRADE SHALL BE PROOF-ROLLED PRIOR TO THE PLACEMENT OF THE AGGREGATE BASE TO IDENTIFY AREAS OF UNSTABLE SUBGRADE.
   - B. IF PROOF ROLLING DETERMINES THAT THE SUBGRADE STABILIZATION CANNOT BE ACHIEVED, THE FOLLOWING ALTERNATIVES WILL BE IMPLEMENTED:
     - a. REMOVE UNSUITABLE MATERIAL AND REPLACE WITH SUITABLE EMBANKMENT.
     - b. SCARIFY, DRY, AND RECOMPACT SUBGRADE AND PERFORM ADDITIONAL PROOF ROLL.
     - c. INCREASE ROAD BASE THICKNESS.
   - C. PROVIDE 1 MOISTURE DENSITY COMPACTION TESTS FOR EVERY 1000 L.F. OF ROAD LENGTH. COMPACTED SUBGRADE MUST BE COMPACTED TO A MINIMUM OF 95% MODIFIED PROCTOR MAXIMUM DRY DENSITY AT ±3% OF OPTIMUM MOISTURE CONTENT FOR GRANULAR SOILS AND AT -1 TO +3% OF OPTIMUM MOISTURE CONTENT FOR COHESIVE SOILS.
3. AGGREGATE BASE:
   - A. AGGREGATE BASE SHALL BE PROOF-ROLLED OVER THE ENTIRE LENGTH. PROVIDE 1 SIEVE ANALYSIS PER 2500 CY OF ROAD BASE PLACED.
     - a. IF PROOF ROLLING DETERMINES THAT THE ROAD IS UNSTABLE, ADDITIONAL AGGREGATE SHALL BE ADDED UNTIL THE UNSTABLE SECTION IS ABLE TO PASS A PROOF ROLL.

TABLE 1: TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
STRUCTURAL FILL	GRAIN SIZE ANALYSIS, MOISTURE CONTENT, ATTERBERG LIMITS ON FINES CONTENT, AND PROCTOR	1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY	1 PER 2,000 CY OR MIN. 1 PER LIFT
COMPACTED SUBGRADE	PROOF-ROLL	ENTIRE LENGTH
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER 1,000 FT OR MIN. 5 FOR THE SITE
AGGREGATE BASE	PROOF-ROLL	ENTIRE LENGTH
	SIEVE ANALYSIS	1 PER 2,500 CY

GENERAL NOTES:

1. THE PLANIMETRIC FEATURES, GROUND SURFACE CONTOURS ON A LIDAR SURFACE PROVIDED NOAA.
2. NO GRADING OR SOIL DISTURBANCE IS PERMITTED OUTSIDE OF THE GRADING LIMITS IDENTIFIED ON THE PLANS.
3. GRADE ALL PROPOSED ROADS TO THE SLOPES PROPOSED ON THE PLANS.
4. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING DRAINAGE THROUGHOUT THE CONSTRUCTION OF THIS PROJECT. CONSTRUCTION ACTIVITIES SHALL NOT BLOCK THE NATURAL OR MANMADE CREEKS OR DRAINAGE SWALES CAUSING RAINWATER TO POND. ADDITIONAL CULVERTS IN EXCESS OF THOSE ON THE PLANS MAY BE REQUIRED AS APPROVED BY THE ENGINEER.
5. THE CONTRACTOR SHALL NOTIFY DIGSAFE AT LEAST 48 HOURS BEFORE EXCAVATION ACTIVITIES COMMENCE.
6. WETLAND INFORMATION SHOWN ON THE PLAN WAS PROVIDED BY ROB HELLSTROM LAND SURVEYING AND FLAGGED BY HIGHLANDS SOILS. THE GENERAL CONTRACTOR SHALL VERIFY THAT ALL WETLAND PERMITS HAVE BEEN SUBMITTED AND APPROVED PRIOR TO CONSTRUCTION COMMENCING.
7. ELECTRICAL COLLECTION SYSTEM SHOWN ON THE PLAN SHALL BE CONSIDERED PRELIMINARY. CONTRACTOR SHALL REFER TO FINAL ELECTRICAL DESIGN PLANS FOR ACTUAL DESIGN LOCATIONS.

STORMWATER POLLUTION PREVENTION PLAN (SWPPP):

1. REFER TO THE SWPPP BOOKLET FOR SEDIMENT AND EROSION CONTROL PROCEDURES, LOCATIONS OF BMPs, DETAILS, AND INSPECTION INFORMATION.
2. ALL AREAS DISTURBED DURING CONSTRUCTION ACTIVITIES AND NOT COVERED BY ROAD SURFACING MATERIALS, SHALL BE SEEDED IN ACCORDANCE WITH THE SWPPP PLAN.
3. TEMPORARY EROSION CONTROL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE TEMPORARY EROSION CONTROL PLAN SHALL BE IN ACCORDANCE WITH STATE OF CONNETICUT, THE EPA, AND THE SWPPP ON FILE.

SLOPE STABILIZATION:

ALL AREAS DESIGNATED ON THE PLAN FOR SLOPE STABILIZATION SHALL BE GRADED AND COMPACTED, SMOOTH AND CLEAN TO THE FINISH CONTOURS SHOWN ON THE PLAN, WITH A MINIMUM OF 4 INCHES OF TOPSOIL PLACED ON THE AREA. STABILIZATION SHALL BE ACHIEVED IN ONE OF TWO MANNERS:

EITHER: 1) HAND-PLACED RIPRAP
OR:
2) SEED WITH EROSION CONTROL AND REVEGITATION MAT (ECRM)

1. PLACEMENT OF RIP-RAP

RIPRAP HAND PLACED. HAND-PLACED RIPRAP SHALL CONSIST OF ROUGH UNHEWN QUARRY STONES, APPROXIMATELY RECTANGULAR, PLACED DIRECTLY ON THE SPECIFIED SLOPES OR SURFACES. IT SHALL BE SO LAID THAT THE WEIGHT OF THE LARGE STONES IS CARRIED BY THE SOIL RATHER THAN BY ADJACENT STONES. STONES SHALL WEIGH BETWEEN 50 AND 150 LB. EACH AND AT LEAST 60 % OF THEM SHALL WEIGH MORE THAN 100 LB. EACH WHEN USED ON EMBANKMENT CONSTRUCTION. RIP RAP FOR BMPS SHALL BE 6"-8" DIA. PREPARATION FOR HAND-PLACED RIP RAP. BEFORE ANY RIP RAP IS PLACED, THE SURFACE TO BE COVERED SHALL BE FULLY COMPACTED AND GRADED TO THE REQUIRED SLOPE. PLACE MIRAFITM8 OR APPROVED EQUAL GEOTEXTILE ON SLOPE. RIP RAP ON SLOPES SHALL COMMENCE COMMENCE IN A TRENCH BELOW THE TOW OF THE SLOPE AND SHALL PROGRESS UPWARD, EACH STONE BEING LAID BY HAND PERPENDICULAR TO THE SLOPE WITH THE LONG DIMENSION VERTICAL, FIRMLY BEDDED AGAINST THE SLOPE AND AGAINST THE ADJOINING STONE, WITH ENDS IN CONTACT, AND WITH WELL-BROKEN JOINTS. SIMILAR METHODS SHALL BE USED WHEN LAYING RIPRAP ON STREAM BEDS, IN DITCHES, AND ON LEVEL SURFACES.

THE FINISHED SURFACE OF THE RIPRAP SHALL PRESENT AN EVEN, TIGHT SURFACE, NOT LESS THAN 12 INCHES THICK, MEASURED PERPENDICULAR TO THE SLOPE.

THE STONES WEIGHING MORE THAN 100 LB. SHALL BE WELL DISPERSED THROUGHOUT THE AREA WITH THE 50-100 LB. STONES LAID BETWEEN THEM IN SUCH A MANNER THAT ALL STONES WILL BE IN CLOSE CONTACT. THE REMAINING VOIDS SHALL BE FILLED WITH SPALLS OF SUITABLE SIZE AND WELL TAMPED TO PRODUCE A FIRM AND COMPACT REVETMENT.

2. STABILIZATION WITH EROSION CONTROL AND REVEGITATION MAT (ECRM)
   1) AREA MUST BE GRADED SMOOTH AND CLEAN TO FINISH GRADES, AND COMPACTED.

   2) SEED AND MULCH AREA. USE SEED MIX APPROVED BY THE ENGINEER.

   3) INSTALL ECRM PER MANUFACTURER'S INSTRUCTIONS, HOWEVER THESE MUST INCLUDE THE FOLLOWING MINIMUM REQUIREMENTS:

      A) GRADE GROUND TO FINISH CONTOURS. REMOVE ALL ROCKS, DIRT CLODS, STUMPS, ROOTS, TRASH, AND OTHER OBSTRUCTIONS LYING IN DIRECT CONTACT WITH THE SOIL SURFACE.

      B) DIG MAT ANCHOR TRENCHES (MINIMUM 12"DEEP, 6" WIDE) AT TERMINAL ENDS AND PERIMETER SIDES WHERE MAT IS TO BE INSTALLED.

      C) INSTALL MAT BY ROLLING UPHILL PARALLEL TO WATER FLOW, STARTING AT TRENCH. OVERLAP ROLLS BY MINIMUM OF 3". FASTEN TO GROUND WITH 18" PINS AND 1 1/2" WASHERS, OR EQUIVALENT. PIN MAT AT ENDS, AND EVERY 3' TO 5' ALONG OVERLAPS. DO NO STRETCH MAT. SPLICING ROLLS SHOULD BE DONE IN A CHECK SLOT. BACKFILL TO COVER ENDS AND FASTENERS, ROLLING MAT ACROSS BACKFILL AND PIN AGAIN.

   FOR MAT USE MIRAFI MIRAMAT TM8 OR EQUIVALENT.

SEEDING:

1. COMPOSITION OF SEED MIX CHANGES YEARLY. SEED SPECIFICATIONS MUST BE SUBMITTED TO ENGINEER 2 WEEKS PRIOR TO INSTALLATION. ALL SPECIES MUST BE NATIVE TO WORCESTER COUNTY.
2. RESTORED AREAS TO BE SEEDED WITH ABOVE MIX OR EQUAL (SUBJECT TO ENGINEERS APPROVAL). SEED TO BE LIGHTLY RAKED TO ALLOW FOR PROPER SEED/SOIL CONTACT.
3. CONTRACTOR SHALL OVERSEED AND/OR RE-MULCH AS NECESSARY TO ESTABLISH A GOOD COVER OF VEGETATION, WHETHER DUE TO POOR INITIAL COVER, INCLEMENT WEATHER BEFORE/DURING/AFTER SEEDING, OR THE ONSET OF WINTER.
4. RILLING, GULLIES, OR OTHER EROSION DUE TO POOR COVER SHALL BE RAKED AND/OR REFILLED AND REMULCH/RESEEDED.
5. CONTRACTOR SHALL WARRANTEE SEEDING, MULCHING AND EROSION CONTROL FABRIC FOR ONE YEAR FROM THE SUBSTANTIAL COMPLETION OF THE RELEVANT AREA OF WORK.

INVASIVE SPECIES:

1. ALL EQUIPMENT SHALL BE INSPECTED UPON ARRIVAL. EQUIPMENT ARRIVING WITH OBSERVABLE SOIL OR PLANT FRAGMENTS WILL BE REMOVED AND CLEANED.
2. HAY BALES ARE NOT BE USED ON SITE; ONLY WEED-FREE STRAW BALES ARE APPROVED.
3. OFF-SITE TOPSOIL MUST BE FREE OF INVASIVE SPECIES. THE ENGINEER SHALL BE NOTIFIED OF THE TOPSOIL SOURCE 6 WEEKS BEFORE DELIVERY.

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Designed: ADC
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Revisions:

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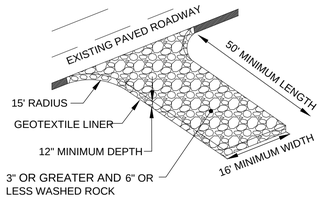
CIVIL AND EROSION CONTROL NOTES

SITING BOARD REVIEW

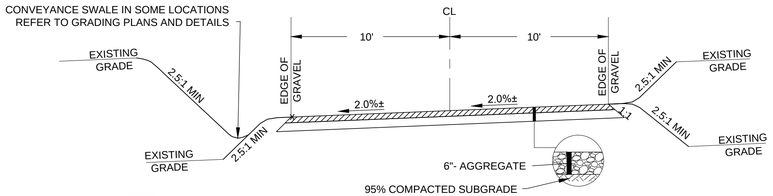
DATE: 03/15/2016
SHEET: 16 of 17



NOTE:

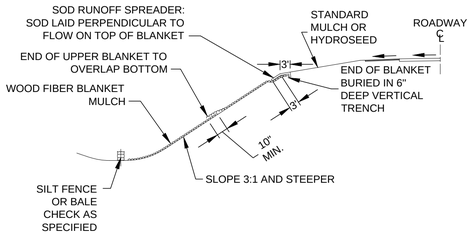
ROCK CONSTRUCTION ENTRANCE SHOULD BE A MINIMUM THICKNESS OF 1.0' AND CONTAIN MAXIMUM SIDE SLOPES OF 4:1. ROCK ENTRANCE SHOULD BE INSPECTED AND MAINTAINED REGULARLY. ROCK ENTRANCE LENGTH MAY NEED TO BE EXTENDED IN CLAY SOILS.

ROCK CONSTRUCTION ENTRANCE



NOTES:
1. CONTRACTOR TO SUBCUT ROADWAY TO EXISTING GRADE ELEVATION TO MAINTAIN EXISTING SITE DRAINAGE PATTERNS WHEREVER POSSIBLE.
2. IN FILL LOCATIONS CONTRACTOR TO GRADE TOE OF SLOPE TO EXISTING GRADE, AND MAINTAIN NATURAL DRAINAGE PATTERNS.
3. IN CUT LOCATIONS CONTRACTOR TO CREATE SWALE ON DOWNSTREAM SIDE, REFER TO GRADING PLANS FOR DETAILS.
4. CONTRACTOR TO COMPACT AGGREGATE TO 95% MAXIMUM DRY DENSITY.
5. REFER TO GEOTECHNICAL RECOMMENDATIONS FOR ADDITIONAL ROADWAY SECTION DESIGN INFORMATION.

ACCESS ROAD DETAIL



EROSION CONTROL BLANKET INSTALLATION ON AN INSLOPE
(WHEN REQUIRED)

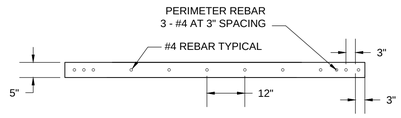
CATEGORY	SLOPE	VELOCITY
1	FLAT	-
2	3:1	< 5.0 fps
3	3:1	< 6.5 fps
4	2:1	< 7.0 fps

CATEGORY	ACCEPTABLE TYPES
1	STRAW RD 1S, WOOD FIBER RD 1S
2	STRAW 1S, WOOD FIBER 1S
3	STRAW 2S, WOOD FIBER 2S
4	STRAW/COCONUT 2S, WOOD FIBER HV 2S

THE LETTERING DESIGNATION SHALL BE DEFINED AS FOLLOWS:

1S - NETTING ON ONE SIDE
RD - RAPIDLY DEGRADABLE
2S - NETTING ON TWO SIDES
HV - HIGH VELOCITY

EROSION CONTROL BLANKET

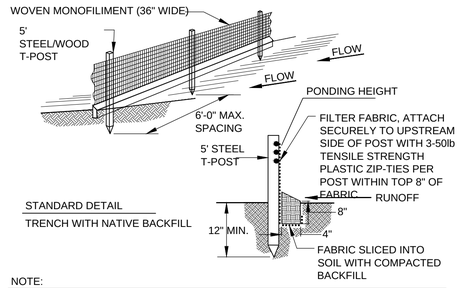


NOTES:
REBAR 3" FROM ALL EDGES & CUTOUTS. 3" SPACING ON FIRST THREE PERIMETER REBARS, 12" ON ALL OTHER INTERIOR.

3,000 PSI CONCRETE. TOP TO BE SMOOTH AND LEVEL. TOP EDGES TO HAVE 1" BEVEL.

FINAL PAD DESIGN DEPENDENT ON FINAL EQUIPMENT WEIGHT AND STRUCTURAL ENGINEERS DETERMINATION

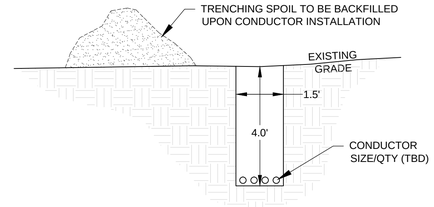
UTILITY PADS CONCRETE SECTION



NOTE:

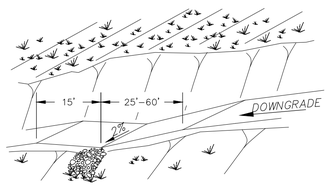
1. INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT AND REMOVE SEDIMENT WHEN ACCUMULATED TO 1/3 THE HEIGHT OF THE FABRIC OR MORE.
2. REMOVED SEDIMENT SHALL BE DEPOSITED TO AN AREA THAT WILL NOT CONTRIBUTE SEDIMENT OFF-SITE AND CAN BE PERMANENTLY STABILIZED.
3. SILT FENCE SHALL BE PLACED ON SLOPE CONTOURS TO MAXIMIZE PONDING EFFICIENCY.
4. ALL ENDS OF THE SILT FENCE SHALL BE WRAPPED UPSLOPE SO THE ELEVATION OF THE BOTTOM OF FABRIC IS HIGHER THAN "PONDING HEIGHT".

SILT FENCE

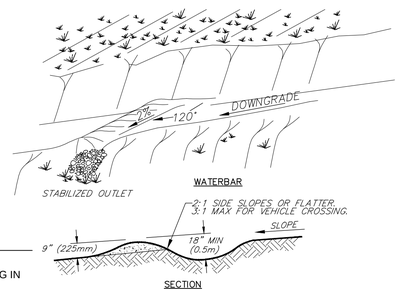


NOTES:
1. CONDUCTOR CLEARANCES DEPENDENT ON GEOTECHNICAL PARAMETERS AND ELECTRICAL DESIGN
2. CONDUCTOR SIZING AND QUANTITIES PER TRENCH DEPENDENT ON FINAL ELECTRICAL DESIGN TRENCH DIMENSIONS FOR EARTHWORK QUANTITIES ARE CONSERVATIVE.

TRENCHING DETAIL



ROLLING DIP



SECTION

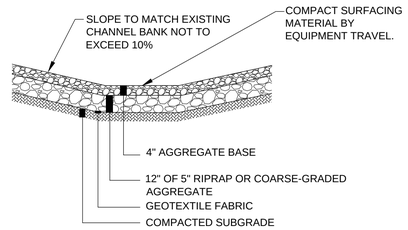
NOTE:

1. CONTRACTOR HAS THE ABILITY DEPENDING ON FIELD LOCATED GRADE AND GRADE TRANSITIONS TO INSTALL ROLLING DIPS OR WATERBARS AT THE RECOMMENDED SPACING IN TABLE 1.
2. ROLLING DIPS AND WATERBARS WILL REQUIRE MAINTENANCE FOLLOWING RAINFALL EVENTS TO ENSURE FUNCTIONALITY.
3. THE ROLLING DIPS AND WATERBARS SHOULD BE BUILT AT AN ANGLE OF 45° TO 60° FROM THE CENTERLINE.
4. THE DIVERSION SHOULD HAVE A POSITIVE GRADE OF 2% MINIMUM.
5. FOR ROLLING DIPS, THE HEIGHT FROM CHANNEL BOTTOM TO THE TOP OF THE SETTLED RIDGE SHALL BE 18 INCHES AND THE SIDE SLOPES OF THE RIDGE SHALL BE 2:1 OR FLATTER.
6. STABLE OUTLETS SHALL EITHER BE AN EXTENSION OF AN ADJACENT SWALE, OR 2 CU. YD. 6" RIP RAP AT OTHER LOCATIONS.
7. SEDIMENT SHALL BE REMOVED FROM THE FLOW AREA THROUGHOUT THE DURATION OF THE PROJECT, REFER TO THE PROJECTS STORMWATER O&M MANUAL.

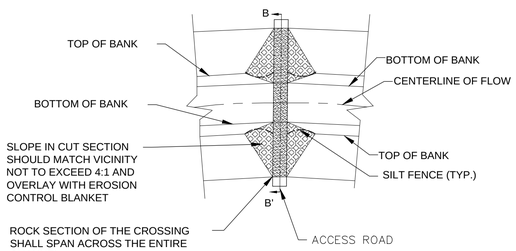
TABLE 1: ROLLING DIP AND WATERBAR SPACING RECOMMENDATIONS

SLOPE (%)	SPACING (FT)
<5	125
5–10	100
10–20	75

ROLLING DIP AND WATERBAR



SECTION B' - B'
PROFILE ALONG CENTERLINE OF LOW WATER CROSSING
NOT TO SCALE



PLAN VIEW OF LOW WATER CROSSING
NOT TO SCALE

NOTE:

1. CROSSINGS SHALL HAVE THE TOP-MOST SURFACE LAYER EVEN OR BELOW THE ELEVATION OF THE EXISTING WETLAND.
3. THE ACCESS ROAD SHALL CROSS THE CONVEYANCE AT 90° ANGLE.
4. THE TOP BED OF THE ROCK CHANNEL CROSSING SHALL CONFORM TO THE EXISTING DITCH CROSS SECTIONAL SLOPES.
5. MATERIAL THICKNESSES MAY BE FIELD ADJUSTED TO ACHIEVE SUFFICIENT BEARING CAPACITIES AS ARE NECESSARY FOR ANTICIPATED ROAD USE.

LOW WATER CROSSING

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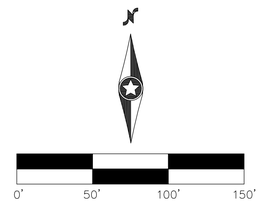

PLAINFIELD PIKE SOLAR

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PLAINFIELD, CT 06374
WINDHAM COUNTY

CIVIL AND EROSION CONTROL DETAILS

SITING BOARD REVIEW

DATE: 03/15/2016
SHEET: 17 of 17

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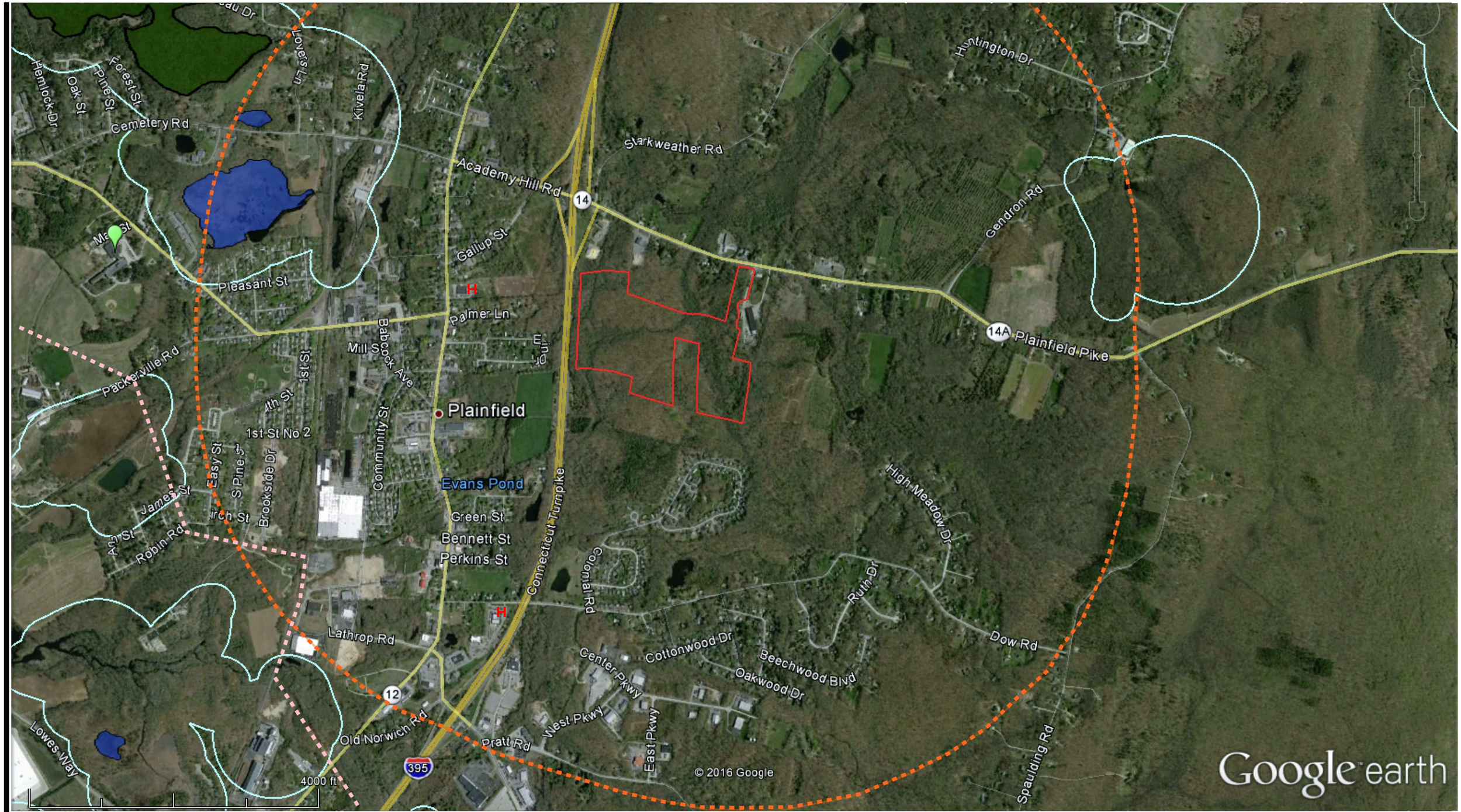


Data Source(s): DEEP (2016);
Google Imagery (Accessed 2016).

Notes:
1. No group homes within map extent
2. No historic areas within map extent
3. No areas of geologic or archaeological interest within map extent.

Legend

- Project Area
- 1 Mile Project Buffer
- County Border
- School
- H Hospital
- Natural Diversity Area
- WMA
- Transmission Line
- Road

Critical Habitat

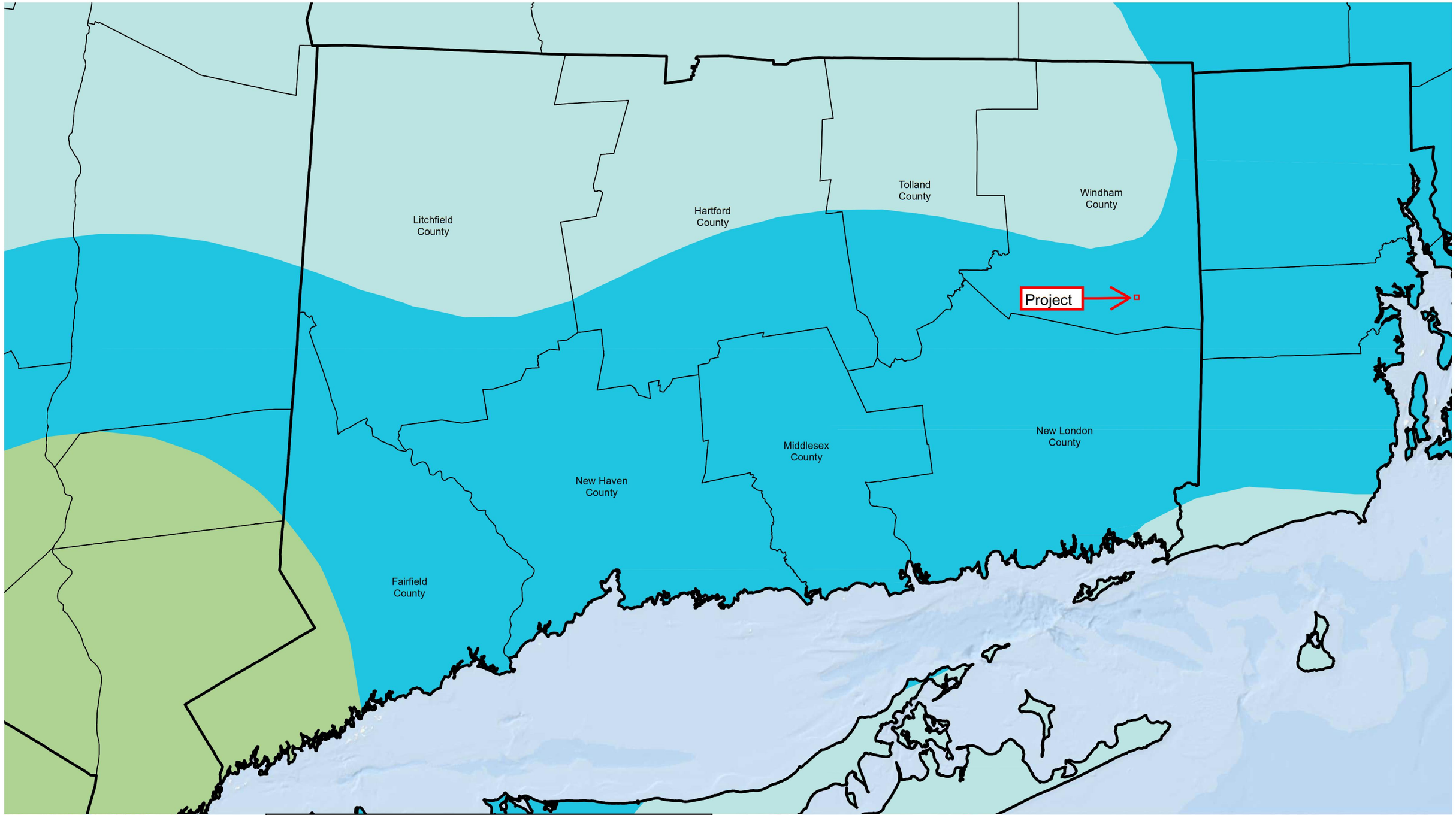
- Palustrine Forested
- Palustrine Non-Forested

Plainfield Solar

Windham County, Connecticut

Vicinity Map

February 4, 2016



Data Source(s): World Oceans Map via Esri WMS (Accessed 2015);

Legend

- Project Area
- County Boundary
- State Boundary

U.S. Seismic Hazard 2% in 50 years PGA

Hazard (%g)

0-2	8-10	30-40
2-4	10-14	40-80
4-8	14-20	> 80
	20-30	

N

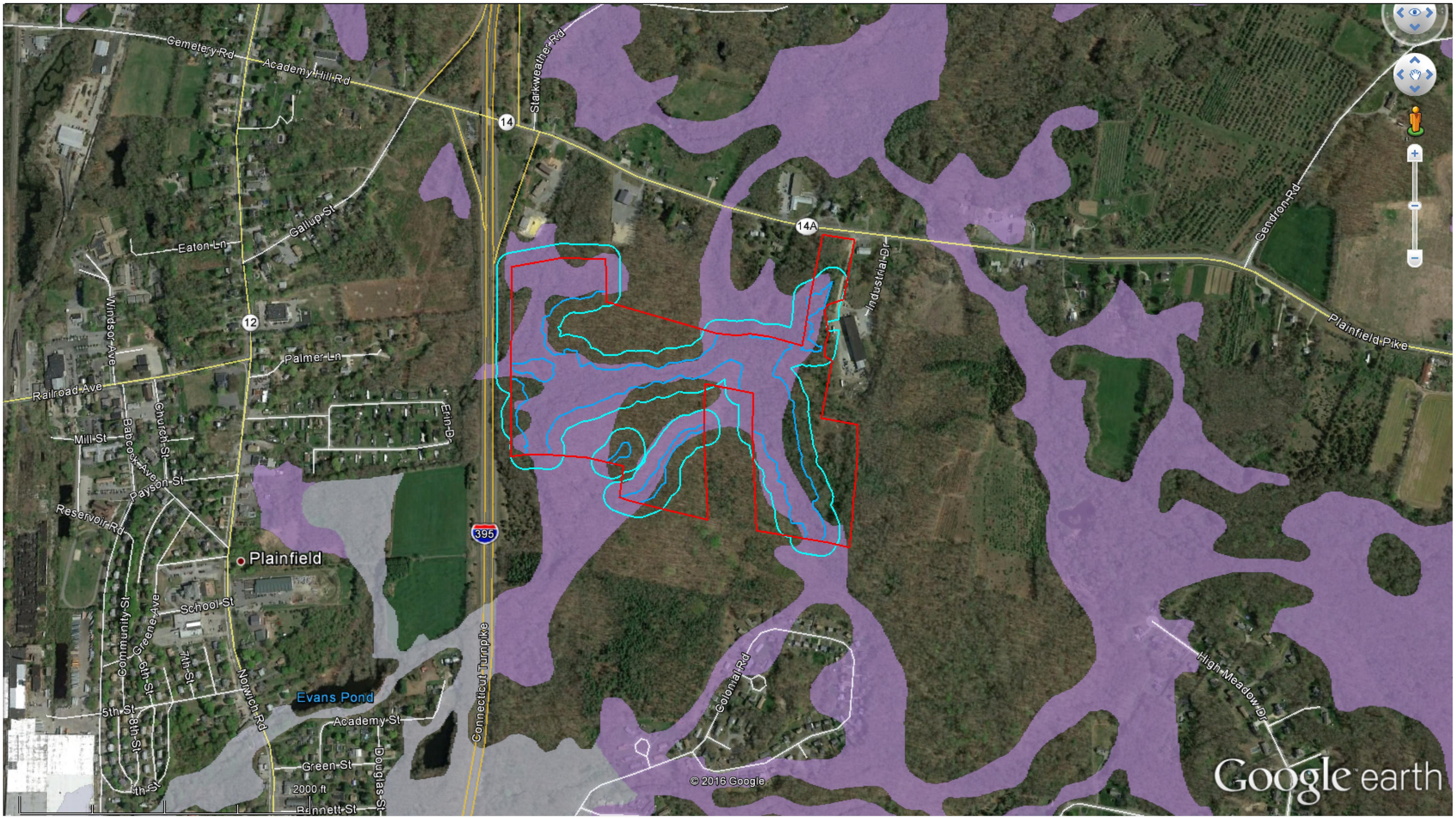
0 Miles 9

Plainfield Pike Solar

Windham County, Connecticut

2014 Connecticut Hazard Map

February 4, 2016



Data Source(s): DEEP (2015)

Notes:
1.Project site is not located within one mile of areas regulated under the Tidal Wetlands Act and Coastal Zone Management Act.

Legend

- Project Area

Inland Wetland Soils

- Poorly Drained and Very Poorly Drained Soils
- Alluvial and Floodplain Soils
- Wetland Delineated
- Wetland Buffer Delineated

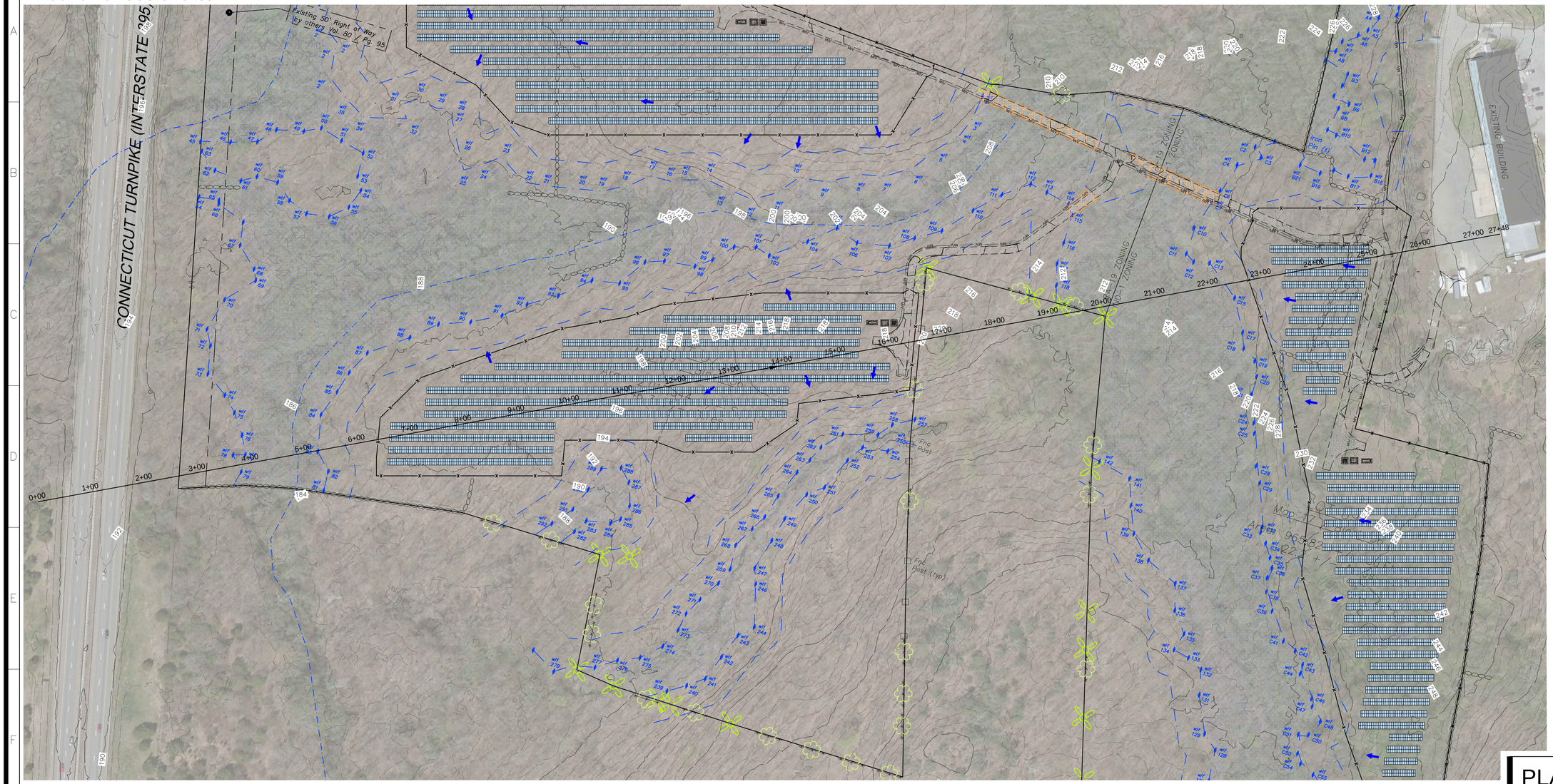
Plainfield Pike Solar

Windham County, Connecticut

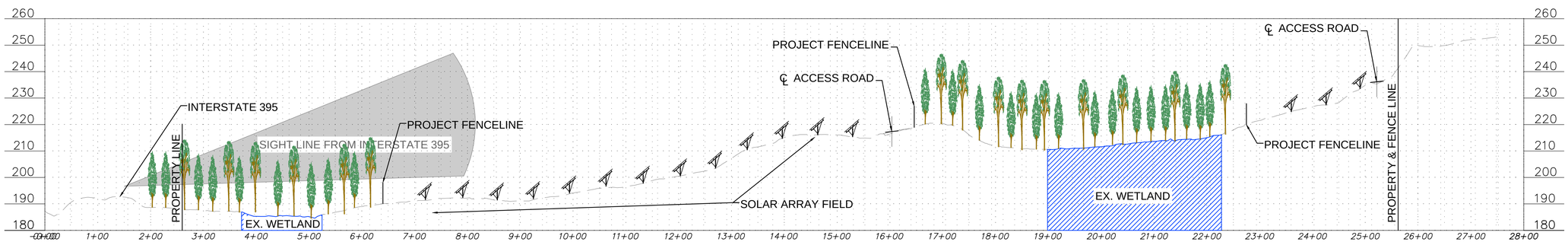
Soils and
Delineated Wetlands

February 4, 2016

PROJECT CROSS SECTION:



PROJECT PROFILE:



Westwood

Phone (480) 747-6558
Fax (480) 376-8025
6909 East Greenway Parkway, Suite 250
Scottsdale, AZ 85254
westwoodps.com

Westwood Professional Services, Inc.

STATE OF CONNECTICUT
ROBERT D. CHRISTIE
0030668
LICENSED
PROFESSIONAL ENGINEER

Designed:	ADC
Checked:	SAW
Drawn:	SJB
Record Drawing by/date:	

Revisions:

#	DATE	DESCRIPTION
-	2/06/2016	PRELIMINARY SITE PLAN

Prepared for:

ecos ENERGY
222 SOUTH 9TH STREET
SUITE 1600
MINNEAPOLIS, MN 55402

N

0' 100' 200' 300'

PLAINFIELD PIKE SOLAR

91 PLAINFIELD PIKE RD
PLAINFIELD, CT 06374
WINDHAM COUNTY

PROJECT CROSS SECTION

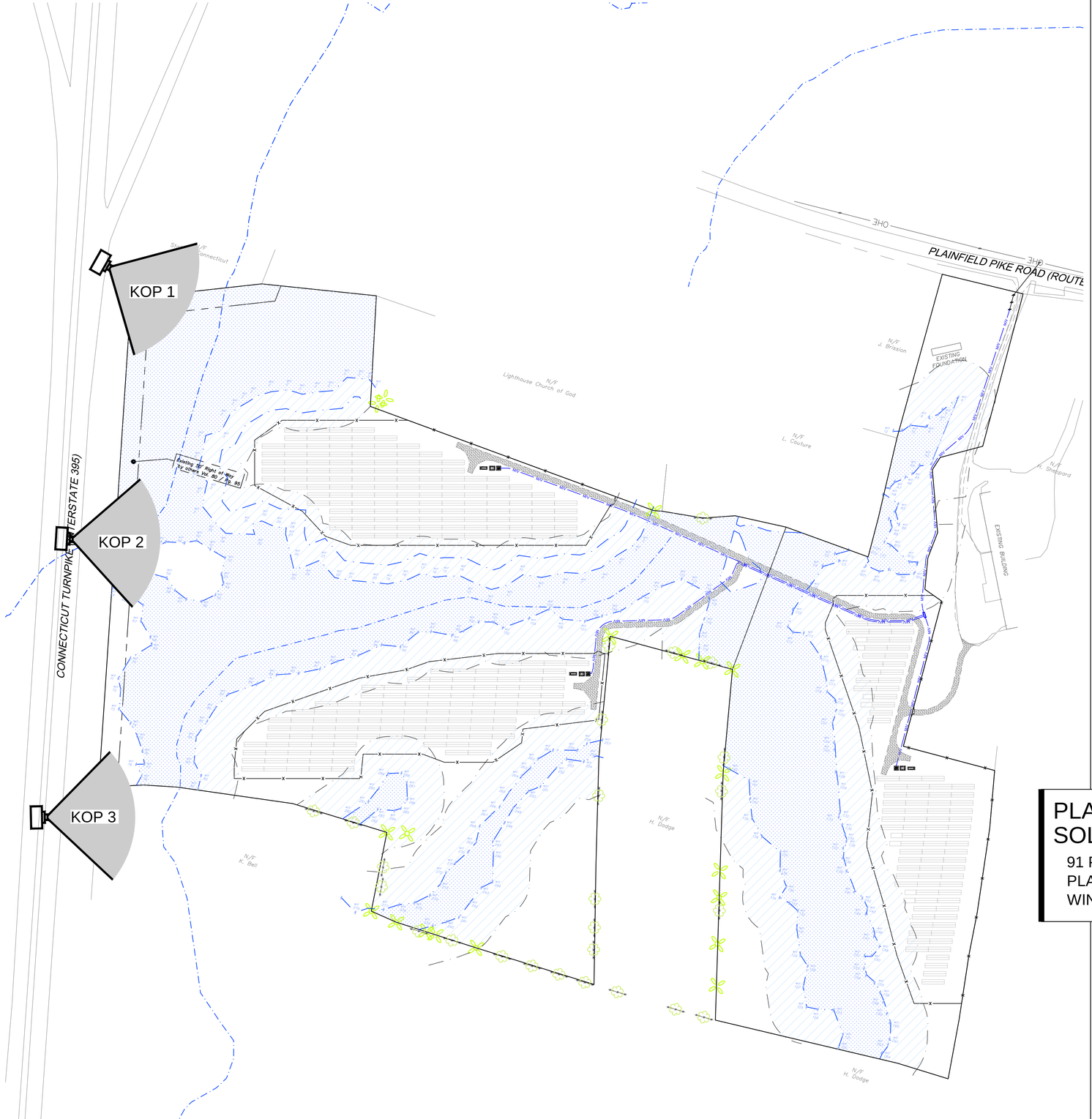
SITING BOARD REVIEW

DATE: 03/03/2016
SHEET: 14 of 17

KOP 1 - 395 LOOKING EAST TOWARDS THE SITE

KOP 2 - 395 LOOKING EAST TOWARDS THE SITE

KOP 3 - 395 LOOKING EAST TOWARDS THE SITE



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0030668
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Drawn:	SJB
Record Drawing by/date:	

Revisions:

#	DATE	DESCRIPTION
-	2/06/2016	PRELIMINARY SITE PLAN

Prepared for:

ecos ENERGY
222 SOUTH 9TH STREET
SUITE 1600
MINNEAPOLIS, MN 55402

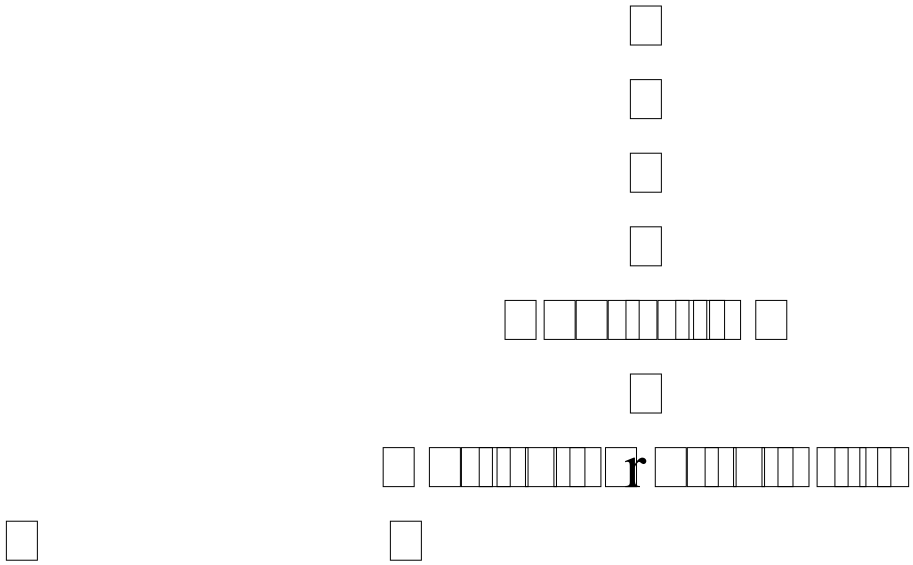
PLAINFIELD PIKE SOLAR

91 PLAINFIELD PIKE RD
PLAINFIELD, CT 06374
WINDHAM COUNTY

KEY OBSERVATION POINT PLAN

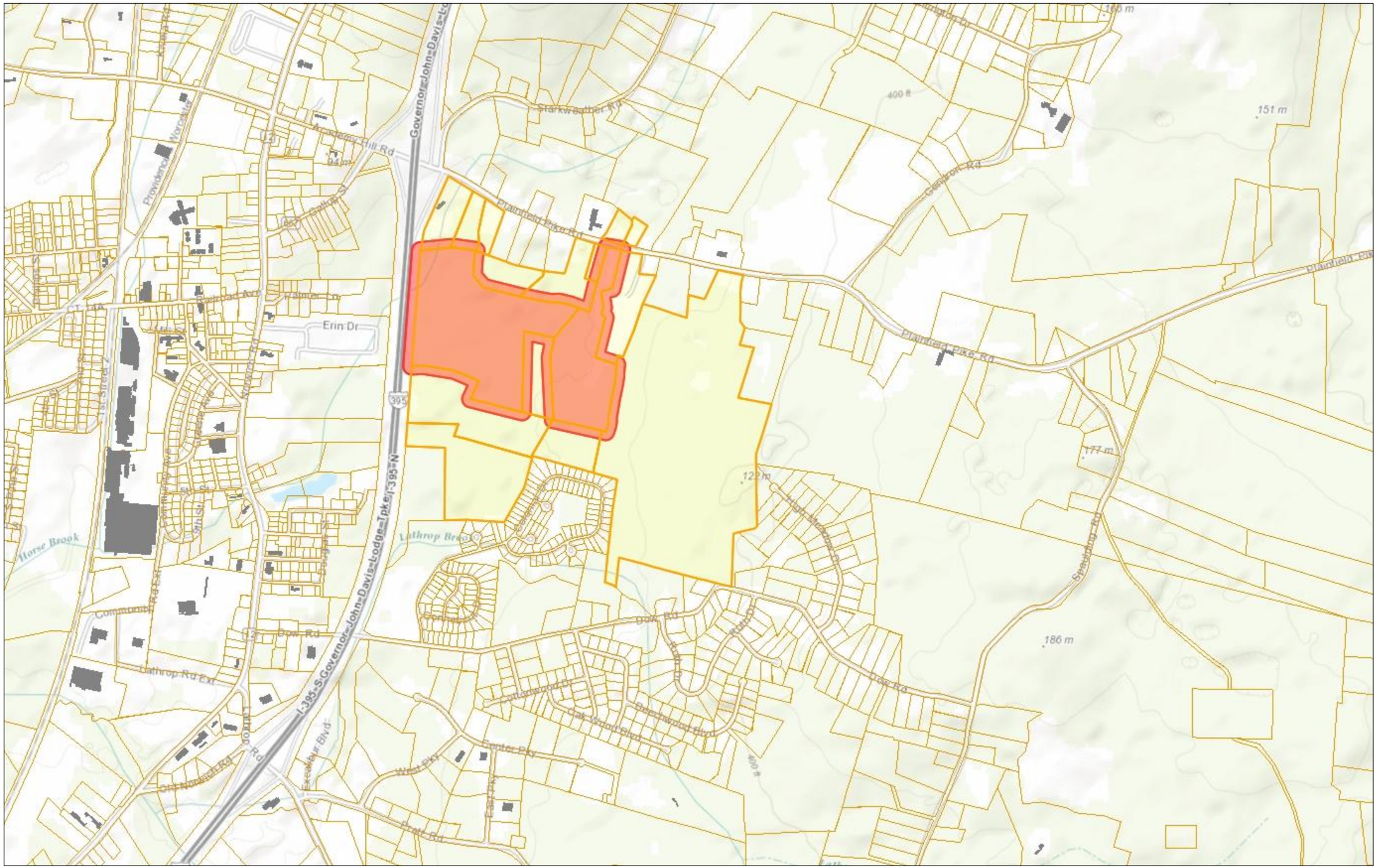
SITING BOARD REVIEW

DATE: 03/03/2016
SHEET: 15 of 17



neccog

Plainfield Pike Abutters Map



Legend

- Town
- Buildings
- Parcels

1:18,055

0.6 0 0.28 0.6 Miles

WGS_1984_Web_Mercator_Auxiliary_Sphere

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.
THIS MAP IS NOT TO BE USED FOR NAVIGATION

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George C. Jepsen, Attorney General
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Office of Policy and Management
Benjamin Barnes, Secretary
450 Capitol Avenue
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Department of Consumer Protection
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165 Capitol Avenue, Room 103
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Council on Environmental Quality
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1111 Country Club Road
MIDDLETOWN CT 06457-2389

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CT State Representative District 044
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Legislative Office Building
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Legislative Office Building
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William Knight, Chairman
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Town of Plainfield Plann and Zoning Commission
Karla Desjardins, Chairman
8 Community Ave
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Town of Plainfield
Ryan Brais, Zoning Officer
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Walter Cwynar, Chairman
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Louisa Trakas, Town Clerk
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Northeastern Connecticut Council of Governments
John Filchak, Executive Director
PO Box 759
DAYVILLE CT 06241-0759

Petition for Declaratory Ruling for Plainfield Pike Solar Project

Phase I Environmental Site Assessment

Plainfield Pike
Plainfield, Connecticut

Prepared for:

Ecos Energy, LLC

Prepared by:

Rincon Consultants, Inc.

Environmental Scientists Planners Engineers

Rincon Consultants, Inc.
5135 Avenida Encinas, Suite A
Carlsbad, California 92008

760 918 9444
FAX 918 9449

info@rinconconsultants.com
www.rinconconsultants.com

November 18, 2015
Project 15-02082

Brad Wilson
Project Manager, Ecos Energy LLC
222 South 9th Street, #1600
Minneapolis, Minnesota 55402

Phase I Environmental Site Assessment
Plainfield Pike, Plainfield, Connecticut

Dear Mr. Wilson:

This report presents the findings of a Phase I Environmental Site Assessment (ESA) completed by Rincon Consultants, Inc. for the site located near Plainfield Pike in Plainfield, Connecticut. The Phase I ESA was performed in accordance with our proposal and contract dated October 8, 2015.

The accompanying report presents our findings and provides an opinion regarding the presence of recognized environmental conditions. Our work program for this project, as referenced in our contract, is intended to meet the guidelines outlined in the American Society for Testing and Materials (ASTM), Standard Practice for Environmental Site Assessments: *Phase I Environmental Site Assessment Process* (ASTM Standard E-1527-13). Our scope of services, pursuant to ASTM practice, did not include any inquiries with respect to asbestos, lead-based paint, lead in drinking water, wetlands, regulatory compliance, cultural and historic resources, industrial hygiene, health and safety, ecological resources, endangered species, vapor intrusion or other indoor air quality, mold, or high voltage power lines.

Thank you for selecting Rincon for this project. If you have any questions, or if we can be of any future assistance, please contact us.

Sincerely,
RINCON CONSULTANTS, INC.

Sarah A. Larese
Senior Environmental Scientist

Walt Hamann, PG, CEG, CHG
Vice President

Table of Contents

Phase I Environmental Site Assessment

Plainfield Pike

Plainfield, Connecticut

EXECUTIVE SUMMARY

This report presents the findings of a Phase I Environmental Site Assessment (ESA) for the 68.6-acre property located near Plainfield Pike, Plainfield, Connecticut (Figure 1, Vicinity Map). The subject property is currently dense undeveloped woodlands.

Rincon Consultants performed a reconnaissance of the subject property on October 21, 2015. The purpose of the reconnaissance was to observe existing subject property conditions and to obtain information indicating the presence of recognized environmental conditions in connection with the subject property. Because the subject property is covered with undeveloped woodlands, the subject property was inaccessible. However, the subject property was observed from vantage points along Highway 395 and Plainfield Pike. The use, storage or disposal of hazardous materials on the subject property was not observed during the site reconnaissance.

The subject property is located in an area that is primarily comprised of residential, light industrial and agricultural land uses. Properties in the vicinity of the subject property include single-family residences, a church, light industrial facilities, and vacant land.

Environmental Data Resources, Inc. (EDR) was contracted to provide a database search of public lists of sites that generate, store, treat or dispose of hazardous materials or sites for which a release or incident has occurred. The EDR search was conducted for the subject property and included data from surrounding sites within a specified radius of the property. The subject property was not listed in any of the databases searched by EDR. One adjacent property was listed in databases searched by EDR: State of Connecticut Department of Transportation (DOT) was listed as a CT LWDS, CT MANIFEST, CT NPDES, CT LUST, CT SPILLS, and a CT CPCS site.

- ***State of Connecticut Department of Transportation (DOT) Plainfield / CT DOT Maintenance Garage at 9 Plainfield Pike Road:*** This property is located adjacent to the north of the northwestern portion of the subject property. According to the EDR report, hazardous waste generated by the onsite facility is transported offsite, and the facility holds wastewater and stormwater permits for vehicle maintenance activities.

  The CT SPILLS database listing for this property indicates that a release of gasoline affected the soil onsite in 1998, a 3,000-gallon UST was removed and "routine changed due to age," contaminated soils were noted, contamination was to be removed, and a "sheen on groundwater" was noted as well.

  The Connecticut Leaking Underground Storage Tank (CT LUST) database for this property indicates that a release of motor fuel from a UST occurred onsite in 1998, the tank was removed and soil was excavated, soil and groundwater samples were collected, and the case status was "cleanup initiated" as of July 2013. According to Ms. Joanna Burnham of the Connecticut Department of Energy and Environmental Protection's (DEEP) UST and Petroleum Division during a telephone conversation with Rincon Consultants on November 10, 2015, a 1,000-gallon UST was removed from the site in 1991 and the report was written in 1998; case closure was requested but additional information was required at the time of the request. Another CT LUST database listing for this property indicates that the status for a 1989 release of commercial heating fuel greater than 2,100 gallons is "completed."

The Connecticut Contaminated or Potentially Contaminated Sites (CT CPCS) database includes "hazardous waste facilities" in Connecticut. The listing for this property indicates that the property is a LUST site, cleanup was initiated, and remediation was started. Another CT CPCS database listing for this property indicates that the onsite LUST status is "completed" per the DEEP's significant hazard definition. Rincon contacted Mr. Paul Clark and Mr. Kevin Neary of the DEEP Remediation Division on November 10, 2015 and left voicemails for both contacts requesting additional information on this site; a response has not been received as of the date of this report.

Based on the nature of the listings and the proximity of the site to the subject property, the adjacent Connecticut DOT maintenance garage is considered a *potential REC*.

In addition, two nearby properties were listed in databases searched by EDR: BST Systems was listed as a CT ENF, RCRA-LQG, FINDS, and a MANIFEST site with several states, and Cournoyer Residence was listed as a CT LUST, CT SPILLS, and CT CPCS site.

- ***BST Systems at 78 Plainfield Pike Road***: This property is located approximately 100 feet to the northwest of the subject property across Plainfield Pike Road. According to their website, BST Systems, Inc. is "*a successful, engineering oriented, high-technology business, dedicated to the design, development and manufacture of high-energy alkaline electrochemical cells, batteries and support electronic equipment. Established in January 1983, BST has specialized in the manufacture of rechargeable silver-zinc cells and batteries. Currently BST is expanding the Company's focus to include other battery chemistries, including lithium ion, as well as various associated products. BST is continuing to expand its Research & Development department and is conducting R&D in a number of electro-chemistries, including silver zinc improvement.*" According to the EDR report, hazardous waste relating to the onsite manufacture of batteries and other electrochemical products is generated onsite and transported offsite at least once yearly from at least 1984 to 2014. None of the listings are indicative of a hazardous materials release on the site.

- ***Cournoyer Residence at 85 Academy Hill Road***: This property, located approximately 0.25 mile to the northwest of the subject property, was listed on the CT LUST, CT SPILLS, and CT CPCS databases. The CT LUST database listing indicates that a release of heating fuel occurred onsite in December 1998, "micro" wells were installed, groundwater and soil samples were collected, a "survey" was conducted, and the case is ongoing as of 2010. In addition, the release was noted to be due to heating fuel line failure, and 200 to 300 gallons were released to the subsurface; contractor cleanup was overseen and closure samples were obtained.

  The CT SPILLS database listing indicates that 300 gallons of fuel oil were released onsite in December 1998 due to a transfer line leak from the UST system, the release indicator was oil observed on the ground surface, the homeowner repaired the leak, and from the end of October through mid-December approximately 300 gallons were lost.

  The CT CPCS database listing indicates that the property is a pending LUST site. No additional information regarding this release was provided in the EDR report or on the US EPA online RCRAInfo database. Rincon contacted Mr. Paul Clark and Mr. Kevin Neary of the DEEP Remediation Division on November 10, 2015 and left voicemails for both contacts requesting additional information on this site; a response has not been received as of the date of this report.

Based on the distance of the site from the subject property and the potential direction of groundwater flow (to the west, downgradient of the subject property), this site does not represent an environmental concern to the subject property.

Historical sources reviewed as part of the Phase I ESA include aerial photographs and topographic maps. The photos and maps reviewed indicate that the subject property was mainly undeveloped woodland with a cleared area in the southeastern portion of the subject property from approximately 1934 to 1970. A building is present in the northeastern portion of the subject property from approximately 1951 to 1974; by 1986, the building is no longer present and the previously cleared area appears to be fallow. The subject property resembles its present-day configuration from 2005 to 2012. The historic topographic maps reviewed depict the subject property as undeveloped woodland with two streams traversing the property in 1893, 1915, 1943, and 1953; with a structure depicted in the northeastern portion of the subject property in 1970 and 1983.

Based on the findings of this Phase I ESA, it is our opinion that there is one potential Recognized Environmental Condition (REC) in connection with the property as follows:

Potential Recognized Environmental Condition

1. Adjacent Connecticut Department of Transportation maintenance garage

To evaluate the potential subject property impact associated with the adjacent Connecticut DOT maintenance garage, Rincon recommends reviewing any records available at the DEEP's Remediation Division to determine whether remediation for the site was completed and to determine the status of the two known release cases (LUST #31140/SPILLS #9800659 and LUST #29422).

Based on our review of historical sources, it appears that a structure was present in the northeastern portion of the subject property from approximately 1934 to 1970. Although not considered a REC, former building foundations and used building materials may be present in this area.

INTRODUCTION

This report presents the findings of a Phase I ESA conducted for the 68.6-acre property located near Plainfield Pike, Plainfield, Connecticut (Figure 1, Vicinity Map). The Phase I ESA was performed by Rincon Consultants, Inc. for Ecos Energy, LLC in general conformance with ASTM E 1527-13 and our proposal and contract dated October 8, 2015. The following sections present our findings and provide our opinion as to the presence of recognized environmental conditions.

PURPOSE

The purpose of this Phase I ESA was to assess the environmental conditions of a property, taking into account commonly and reasonably ascertainable information and to qualify for Landowner Liability Protections under the Brownfields Amendments to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

A recognized environmental condition (REC) is defined pursuant to ASTM E 1527-13 as,

> *"the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: 1) due to any release to the environment; 2) under conditions indicative of a release to the environment; 3) under conditions that pose a material threat of a future release to the environment".*

A Controlled REC is defined pursuant to ASTM E 1527-13 as,

> *"a recognized environmental condition resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority (for example, as evidenced by the issuance of a no further action letter or equivalent, or meeting risk-based criteria established by regulatory authority), with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls (for example, property use restrictions, activity and use limitations, institutional controls, or engineering controls). A condition considered by the environmental professional to be a controlled recognized environmental condition shall be listed in the findings section of the Phase I Environmental Site Assessment report, and as a recognized environmental condition in the conclusions section of the Phase I Environmental Site Assessment report".*

A Historical REC is defined pursuant to ASTM E 1527-13 as,

> *"a past release of any hazardous substances or petroleum products that has occurred in connection with the property and has been addressed to the satisfaction of the applicable regulatory authority or meeting unrestricted use criteria established by regulatory authority, without subjecting the property to any required controls (for example, use restrictions, activity and use limitations, institutional controls, or engineering controls). Before calling the past release a historical recognized environmental condition, the environmental professional must determine whether the past release is a recognized environmental condition at the time the Phase I Environmental Site Assessment is conducted (for example, if there has been a change in the regulatory criteria). If the EP [Environmental Professional] considers the past release to be a recognized environmental condition at the time the Phase I ESA is conducted, the condition shall be included in the conclusions section of the report as a recognized environmental condition".*

A de minimis condition is defined pursuant to ASTM E 1527-13 as,

> "*a condition that generally does not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. Conditions determined to be de minimis conditions are not recognized environmental conditions nor controlled recognized environmental conditions*".

SCOPE OF SERVICES

The scope of services conducted for this study is outlined below:

- Perform a reconnaissance of the site to identify obvious indicators of the existence of hazardous materials.
- Observe adjacent or nearby properties from public thoroughfares in an attempt to see if such properties are likely to use, store, generate, or dispose of hazardous materials.

- Obtain and review an environmental records database search from Environmental Data Resources, Inc. (EDR) to obtain information about the potential for hazardous materials to exist at the subject property or at properties located in the vicinity of the subject property.
- Review files for the subject property and immediately adjacent properties as identified in the EDR report, as applicable.
- Review the current U.S. Geological Survey (USGS) topographic map to obtain information about the subject property's topography and uses of the subject property and properties in the vicinity of the subject property.
- Review additional pertinent record sources (e.g., online databases of hazardous substance release sites), as necessary, to identify the presence of RECs at the subject property.
- Review reasonably ascertainable historical resources (e.g., aerial photographs, topographic maps, fire insurance maps, city directories) to assess the historical land use of the subject property and adjacent properties.
- Provide a property owner interview questionnaire to the property owner or a designated subject property representative identified to Rincon by the client.
- Provide a user interview questionnaire to a representative of the client, the user of the Phase I ESA.
- Conduct interviews with other property representatives (e.g., key site manager, occupants), as applicable.
- Review Client-provided information (e.g., previous environmental reports, title documentation), as applicable.

SIGNIFICANT ASSUMPTIONS, LIMITATIONS, DEVIATIONS, EXCEPTIONS, SPECIAL TERMS, AND CONDITIONS

This work is intended to adhere to good commercial, customary, and generally accepted environmental investigation practices for similar investigations conducted at this time and in this geographic area. No guarantee or warranties, expressed or implied are provided. The findings and opinions conveyed in this report are based on findings derived from a site reconnaissance, review of an environmental database report, specified regulatory records and historical sources, and comments made by interviewees. This report is not intended as a comprehensive site characterization and should not be construed as such. Standard data sources relied upon during the completion of Phase I ESAs may vary with regard to accuracy and completeness. Although Rincon believes the data sources are reasonably reliable, Rincon cannot and does not guarantee the authenticity or reliability of the data sources it has used. Additionally, pursuant to our contract, the data sources reviewed included only those that are practically reviewable without the need for extraordinary analysis.

Rincon has not found evidence that hazardous materials or petroleum products exist at the subject property at levels likely to warrant mitigation. Rincon does not under any circumstances warrant or guarantee that not finding evidence of hazardous materials or petroleum products means that hazardous materials or petroleum products do not exist on the subject property. Additional research, including surface or subsurface sampling and analysis, can reduce the client's risks, but no techniques commonly employed can eliminate these risks altogether.

In addition, pursuant to ASTM E 1527-13 practice, our scope of services did not include any inquiries with respect to asbestos containing building materials, biological agents, cultural and historic resources, ecological resources, endangered species, health and safety, indoor air quality unrelated to release of hazardous substances or petroleum products into the environment, industrial hygiene, lead-based paint, lead in drinking water, mold, radon, regulatory compliance, wetlands, or high voltage power lines.

USER RELIANCE

Ecos Energy, LLC has requested this assessment and will use the assessment to provide information for the purposes of purchasing or acquiring said property. This Phase I ESA was prepared for use solely and exclusively by Ecos Energy, LLC. No other use or disclosure is intended or authorized by Rincon. Also, this report is issued with the understanding that it is to be used only in its entirety. It is intended for use only by the client, and no other person or entity may rely upon the report without the express written consent of Rincon.

SITE DESCRIPTION

Location

The subject property is a 68.6-acre property located east of Interstate 395 and south of Plainfield Pike in Plainfield, Connecticut (Figure 2, Site Map). The property is identified as Assessor Parcel Numbers (APNs) 017-0036-0037 and 017-0036-0069.

Subject Property and Vicinity General Characteristics

The subject property is currently dense undeveloped woodlands.

The subject property is located in an area that is primarily comprised of residential, light industrial, and agricultural land uses. Properties in the vicinity of the subject property include single-family residences, a church, light industrial facilities, and vacant land. The current adjacent land uses are described in Table 1 and depicted on Figure 3, Adjacent Land Use Map.

Table 1 - Current Uses of Adjacent Properties

Area	Use
Northern Properties	Vacant land, the Connecticut Department of Transportation Maintenance Garage, Lighthouse Church of God and Plainfield Pike, followed by single-family residences and BST Systems.
Eastern Properties	Apartments and a vacant building (former flea market), and vacant land.
Southern Properties	Vacant land, followed by single-family residences.
Western Properties	Interstate 395, followed by vacant land, single-family residences, and agricultural fields.

Descriptions of Structures, Roads, Other Improvements on the Site

During the site reconnaissance, no structures, roads or other improvements were observed on the subject property.

Access to the subject property is available from the driveway on the eastern adjacent residential apartment property, 91 Plainfield Pike.

There are no installed utilities on the subject property; however, in the site vicinity Connecticut Water Company provides water and sewer service, Northeast Utilities Company provides electrical service and the Yankee Gas Services Company provides natural gas service. Solid waste collection and disposal services in the area are provided by private vendors.

USER PROVIDED INFORMATION

As described in ASTM E 1527-13 Section 6, Ecos Energy, LLC was interviewed for actual knowledge pertaining to the subject property to help identify recognized environmental conditions in connection with the property. Brad Wilson, Project Developer for Ecos Energy, LLC completed the User Questionnaire as provided by ASTM Appendix X3 on November 16, 2015. A copy of the completed questionnaire is included as Appendix 1.

Based on our review of the completed questionnaire, Mr. Wilson did not review the following sources of information and is unaware of information regarding the following:

- recorded land title records (or judicial records, where appropriate) that identify any environmental liens filed or recorded against the property
- recorded land title records (or judicial records, where appropriate) that identify any activity and land use limitations (AULs), such as engineering controls, land use restrictions or institutional controls that are in place at the property and/or have been filed or recorded against the property under federal, tribal, state or local law
- Title Report that identifies information pertaining to environmental cleanup liens or activity and use limitations (AULs) for the subject property

Based on our review of the completed questionnaire, Mr. Wilson is unaware of information regarding the following:

- specialized knowledge or experience related to the property or nearby properties
- reduction in value for the subject property relative to any known environmental issues
- commonly known or reasonably ascertainable information about the property that would help the environmental professional to identify conditions indicative of releases or threatened releases
- obvious indicators that point to the presence or likely presence of releases at the property
- pending, threatened, or past litigation relevant to hazardous substances or petroleum products, in, on, or from the site
- pending, threatened, or past administrative proceedings relevant to hazardous substances or petroleum products in, on, or from the site
- notice from any government entity regarding any possible violation of environmental laws or possible liability relating to hazardous substances or petroleum products

Additionally, Mr. Wilson indicated that the Phase I ESA is required by the Connecticut solar permitting process, and purchase of the subject property is planned; the purchase price being paid for the subject property reasonably reflects the fair market value of the property.

RECORDS REVIEW

PHYSICAL SETTING SOURCES

Topography

The current USGS topographic map (Plainfield Quadrangle, 1983) indicates that the subject property is situated at elevations ranging from approximately 175 to 225 feet above mean sea level with topography sloping to the west. The adjacent topography consists of western-sloping hills, streams, ponds, and marshes.

Geology and Hydrogeology

According to *The Face of Connecticut: People, Geology, and the Land, State Geological and Natural History Survey of Connecticut, Bulletin 110*, Connecticut is fundamentally divided into a Collision terrane and a Great Crack terrane. The Collision terrane corresponds to the Eastern and Western Uplands, and the Great Crack corresponds to the Central Valley. The terranes may be further divided into four terranes from west to east of the state: the Proto-North American, Iapetos, Newark, Iapetos again, and Avalonian terranes. The Newark Terrane corresponds with the Central Valley Great Crack, and the others are subdivisions of the Uplands Collision terrane. Connecticut's present-day Uplands consist of moderate-sized plateaus and rolling hills.

Site Geology

According to the Connecticut Geological and Natural History Survey, Bedrock Geology of Connecticut, 2000, the western half of the subject property is underlain by mylonite along Paleozoic faults, which is described as fault-related rocks and as *"a compact, chert-like rock without cleavage, but with a streaky or banded structure, producted by the extreme granulation and shearing of rocks that have been pulverized and rolled during overthrusting or intense dynamic metamorphism."* The eastern half of the subject property is underlain by Hope Valley alaskite gneiss, which is described as light pink to grey and medium- to coarse-grained granitic gneiss.

According to the US Department of Agriculture's Natural Resources Conservation Service online Web Soil Survey database, the subject property is mainly comprised of extremely stony Ridgebury, Leicester, and Whitman soils, very stony Canton and Charlton soils, Hinckley loamy sand, and Scarboro muck in approximately zero to 15 percent slopes.

Regional Groundwater Occurrence and Quality

According to the USGS Mineral Resources Online Spatial Data database, the subject property is located within the USGS Quinebaug hydrologic unit and the USGS Connecticut Coastal hydrologic subregion.

During the preparation of this Phase I ESA, we reviewed the USGS's online Groundwater Watch database to determine groundwater elevation in the vicinity of the subject property:

- According to the field groundwater level measurement data for the USGS groundwater well (CT-PL 1) located near the intersection of North Pleasant Street and Pleasant Street in Plainfield, on October 26, 2015 groundwater was reported to be 31.18 feet below ground surface. This well is located approximately 0.72 mile to the west of the subject property.

In addition, according to the Connecticut Leaking Underground Storage Tank database listing for a property located approximately 0.34 mile to the northwest of the subject property, groundwater at the nearby site occurs at 8.54 to 15.36 feet below ground surface and flows to the southwest.

Based on the site topography sloping to the west, groundwater in the vicinity of the subject property is anticipated to flow to the west in accordance with the topographic gradient.

STANDARD ENVIRONMENTAL RECORD SOURCES

Environmental Data Resources, Inc. (EDR) was contracted to provide a database search of public lists of sites that generate, store, treat or dispose of hazardous materials or sites for which a release or incident has occurred. The EDR search was conducted for the subject property and included data from surrounding sites within specified radii of the property. A copy of the EDR report, which specifies the ASTM search distance for each public list, is included as Appendix 2. As shown on the attached EDR report, federal, state and county lists were reviewed as part of the research effort. Please refer to Appendix 2 for a complete listing of sites reported by EDR and a description of the databases reviewed.

The Map Findings Summary, included in the EDR report, provides a summary of the databases searched, the number of reported facilities within the search radii, and whether the facility is located onsite or adjacent to the subject property. The following information is based on our review of the Map Findings Summary and the information contained in the EDR report.

Subject Property

The subject property was not listed on any of the regulatory databases reviewed.

Offsite Properties

Offsite properties listed by EDR fall under two general categories of databases: those reporting unauthorized releases of hazardous substances (e.g., LUST, National Priority List [a.k.a. Superfund sites], and corrective action facilities), and databases of businesses permitted to use hazardous materials or generate hazardous wastes, for which an unauthorized release has not been reported to a regulatory agency.

Rincon reviewed the EDR Radius Map and select detailed listings to evaluate their potential to impact the subject property, based on the following factors:

- Reported distance of the facility from the subject property
- The nature of the database on which the facility is listed, and/or whether the facility was listed on a database reporting unauthorized releases of hazardous materials, petroleum products, or hazardous wastes
- Reported case type (e.g., soil only, failed UST test only)
- Reported substance released (e.g., chlorinated solvents, gasoline, metals)
- Reported regulatory agency status (e.g., case closed, "no further action")
- Location of the facility with respect to the reported groundwater flow direction (discussed in the Geology and Hydrogeology section of this report)

Facilities/properties that were interpreted by Rincon to be of potential environmental concern to the subject property, based on one or more of the factors listed above, are summarized in Table 2. In accordance with ASTM, contamination migration pathways in soil, groundwater, and soil vapor were considered in our analysis of offsite properties of potential environmental concern.

Table 2 - EDR Listing Summary of Select Sites within One-Quarter Mile of the Subject Site

Site Name	EDR Site ID	Site Address	Distance from Subject Property (miles)	Database Reference
Adjacent Properties				
State of Connecticut Department of Transportation Plainfield / CT DOT Maintenance Garage	B6, B7, C8, C9	9 Plainfield Pike Road / Exit 88 Off I-395/ Route 14A & 395	Adjacent Property – North	CT LWDS, CT MANIFEST, CT NPDES, **CT LUST**, **CT SPILLS**, CT CPCS
Nearby Release Sites				
BST Systems	A1, A2, A3, A4, A5	78 Plainfield Pike Road	<1/8 Mile - Northwest	CT ENF, CT MANIFEST, NY MANIFEST, RCRA-LQG, FINDS, NJ MANIFEST, RI MANIFEST, PA MANIFEST
Cournoyer Residence	13	85 Academy Hill Road	1/4-1/2 Mile – Northwest	**CT LUST**, **CT SPILLS**, CT CPCS

Note: EDR databases listed in bold are release databases.

Regulatory agency information reviewed for the listings in the table above are summarized in the Additional Environmental Record Sources section of this report.

Orphan Listings

EDR reported 13 orphan or unmapped site listings, which EDR is unable to plot due to insufficient address information. Based on Rincon's review of the limited address information or site descriptions for the orphan listings, none of the listings are expected to impact the subject property.

ADDITIONAL ENVIRONMENTAL RECORD SOURCES

Review of Agency Files

As a follow-up to the database search, Rincon reviewed regulatory information for facilities within the specified search radii that were interpreted to have the potential to impact the subject property, based on one or more factors previously discussed (e.g., distance, open case status, up-gradient location, soil vapor migration).

The following is a summary of our review of regulatory information obtained from review of online sources (e.g., US EPA online RCRAInfo database) and/or files requested from the applicable regulatory agency, as described below. Copies of selected documents reviewed are included in Appendix 2.

Subject Property
The subject property was not listed in any of the databases searched by EDR.

Adjacent Properties
One adjacent property was listed in databases searched by EDR: State of Connecticut Department of Transportation (DOT) was listed as a CT LWDS, CT MANIFEST, CT NPDES, CT LUST, CT SPILLS, and a CT CPCS site.

- ***State of Connecticut Department of Transportation (DOT) Plainfield / CT DOT Maintenance Garage at 9 Plainfield Pike Road:*** This property is located adjacent to the north of the northwestern portion of the subject property.

  The Connecticut Leachate and Wastewater Discharge Sites (CT LWDS) database listing for this property indicates that the onsite facility has active and inactive ground discharge activity statuses for leachate and waste flow.

  The CT MANIFEST database listing for this property indicates that 68 pounds of solid hazardous waste was generated by the onsite facility and transported offsite.

  The National Pollutant Discharge Elimination System (NPDES) database listing lists wastewater permits issued by the Connecticut Department of Energy and Environmental Protection (DEEP). This listing indicates that the onsite facility holds an active permit through 2021 for "vehicle maintenance wastewater - GP," and holds an active permit through 2016 for "stormwater industrial activities – GP."

  The CT SPILLS database listing for this property indicates that a release of gasoline affected the soil onsite in 1998, a 3,000-gallon UST was removed and "routine changed due to age," contaminated soils were noted, contamination was to be removed, and a "sheen on groundwater" was noted as well.

  The Connecticut Leaking Underground Storage Tank (CT LUST) database for this property indicates that a release of motor fuel from a UST occurred onsite in 1998, the tank was removed and soil was excavated, soil and groundwater samples were collected, and the case status was "cleanup initiated" as of July 2013. According to Ms. Joanna Burnham of the DEEP's UST and Petroleum Division during a telephone conversation with Rincon Consultants on November 10, 2015, a 1,000-gallon UST was

removed from the site in 1991 and the report was written in 1998; case closure was requested but additional information was required at the time of the request.

Another CT LUST database listing for this property indicates that the status for a 1989 release of commercial heating fuel greater than 2,100 gallons is "completed."

The Connecticut Contaminated or Potentially Contaminated Sites (CT CPCS) database includes "hazardous waste facilities" in Connecticut. The listing for this property indicates that the property is a LUST site, cleanup was initiated, and remediation was started. Rincon contacted Mr. Paul Clark and Mr. Kevin Neary of the DEEP Remediation Division on November 10, 2015 and left voicemails for both contacts requesting additional information on this site; a response has not been received as of the date of this report.

Another CT CPCS database listing for this property indicates that the onsite LUST status is "completed" per the DEEP's significant hazard definition.

Nearby Release Sites

One nearby property was listed in databases searched by EDR: BST Systems was listed as a CT ENF, RCRA-LQG, FINDS, and a MANIFEST site with several states, and Cournoyer Residence was listed as a CT LUST, CT SPILLS, and CT CPCS site.

- ***BST Systems at 78 Plainfield Pike Road***: This property is located approximately 100 feet to the northwest of the subject property across Plainfield Pike Road. According to their website, BST Systems, Inc. is "*a successful, engineering oriented, high-technology business, dedicated to the design, development and manufacture of high-energy alkaline electrochemical cells, batteries and support electronic equipment. Established in January 1983, BST has specialized in the manufacture of rechargeable silver-zinc cells and batteries. Currently BST is expanding the Company's focus to include other battery chemistries, including lithium ion, as well as various associated products. BST is continuing to expand its Research & Development department and is conducting R&D in a number of electro-chemistries, including silver zinc improvement.*"

  The Connecticut Enforcement (CT ENF) database listing for this property indicates that the Bureau of Waste Management implemented unspecified hazardous waste enforcement actions in 2001, 2002, and 2007.

  The CT MANIFEST database listing for this property indicates that hazardous waste was transported offsite at least once yearly from 1985 to 2008. The transported hazardous waste included 55 to 5,086 gallons of inorganic, corrosive liquids, potassium hydroxide, and not otherwise specified environmentally hazardous liquids. In addition, the transported hazardous waste included 88 to 4,340 pounds of inorganic, corrosive liquids, paint, caustic alkali liquid, potassium hydroxide solution, silver sludge, filters, scrap cells, negative electrodes, and not otherwise specified liquid and solid hazardous waste.

  The NY MANIFEST database listing for this property indicates that 2,056 pounds of non-listed corrosive wastes generated by the onsite facility were transported in 2005 to a landfill.

  The Resource Conservation and Recovery Act – Large Quantity Generator (RCRA-LQG) database listing for this property indicates that the onsite facility began operations in 1983, and that the onsite facility "generates at least 1,000 kilograms of hazardous waste during any calendar month." In addition, the onsite facility generated ignitable, corrosive, and various other hazardous wastes reported biennially from 1984 through 2014. The listing also indicated that the onsite electroplating operations produce wastewater treatment

sludge, and that various regulation violations were issued for the facility in association with compliance evaluation inspections conducted from 2000 to 2008.

The NJ MANIFEST database listing for this property indicates that hazardous waste generated by the onsite facility was transported in 2004 and 2005.

The RI MANIFEST database listing for this property indicates that 110 gallons of zinc hydroxide sludge were transported in 2003, 3,328 gallons of hazardous waste were transported in 2006, 3,022 gallons of hazardous waste were transported in 2007, and 424 pounds of hazardous waste were transported in 2014.

- ***Cournoyer Residence at 85 Academy Hill Road***: The CT LUST database listing for this property, located approximately 0.25 mile to the northwest of the subject property, indicates that a release of heating fuel occurred onsite in December 1998, "micro" wells were installed, groundwater and soil samples were collected, a "survey" was conducted, and the case is ongoing as of 2010. In addition, the release was noted to be due to heating fuel line failure, and 200 to 300 gallons were released to the subsurface; contractor cleanup was overseen and closure samples were obtained.

  The CT SPILLS database listing indicates that 300 gallons of fuel oil were released onsite in December 1998 due to a transfer line leak from the UST system, the release indicator was oil observed on the ground surface, the homeowner repaired the leak, and from the end of October through mid-December approximately 300 gallons were lost.

  The CT CPCS database listing indicates that the property is a pending LUST site. No additional information regarding this release was provided in the EDR report or on the US EPA online RCRAInfo database. Rincon contacted Mr. Paul Clark and Mr. Kevin Neary of the DEEP Remediation Division on November 10, 2015 and left voicemails for both contacts requesting additional information on this site; a response has not been received as of the date of this report.

  Based on the distance of the site from the subject property and the potential direction of groundwater flow (to the west, downgradient of the subject property), this site does not represent an environmental concern to the subject property.

KNOWN OR SUSPECT CONTAMINATED RELEASE SITES WITH POTENTIAL VAPOR MIGRATION

The EDR report was reviewed to identify nearby known or suspect contaminated sites that have the potential for contaminated vapor originating from the nearby site to be migrating beneath the subject property. Based on the ASTM E 2600-10, *Standard Guide for Vapor Encroachment Screening on Property Involved in Real Estate Transactions*, the following minimum search distances were initially used to determine if contaminated soil vapors from a nearby known or suspect contaminated site have the potential to be migrating beneath the subject property:

- 1/10 mile (528 feet) for petroleum hydrocarbons
- 1/3 mile (1,760 feet) for other contaminants of concern (COCs)

If up-gradient known or suspect contaminated sites are located within the above referenced distances from the subject property, online resources are reviewed to determine the extent of

the contaminated plume at those sites. The following describes search distances for contaminated plumes of petroleum hydrocarbons and other COCs.

Petroleum Hydrocarbons

Based on our review of the EDR report information as indicated above, there are no adjacent or up-gradient known or suspect petroleum hydrocarbon impacted soil or groundwater plumes located within 30 feet of the subject property.

Other COCs

Based on our review of the EDR report, there are no adjacent or up-gradient known or suspect contaminated soil or groundwater plumes located within 100 feet of the subject property.

Review of State of Connecticut Oil and Gas Sites

EDR indicated that there are no oil wells in the state of Connecticut. In addition, a review of Connecticut oil and gas fracking sites[1] indicates that no natural gas drilling sites are located within ¼ mile of the subject property.

HISTORICAL USE INFORMATION ON THE PROPERTY AND THE ADJOINING PROPERTIES

The historic records review completed for this Phase I ESA includes aerial photographs, topographic maps, fire insurance maps, and city directories as detailed in the following sections. Copies of the historical resources reviewed are included in Appendix 3. Table 3 provides a summary of the historical use information available for the subject property.

Review of Historic Aerial Photographs

Aerial photographs from EDR's aerial photograph collection were obtained and reviewed.

Review of City Directory Listings

EDR was contracted to provide copies of city directory listings for the subject property. As indicated in the attached report, no records were available for the subject property, western or southern adjacent properties.

Review of Fire Insurance Maps

EDR was contracted to provide copies of fire insurance maps for the subject property. As indicated in the attached report, fire insurance maps were not available for the subject property or adjacent properties.

[1] Drilling Maps: Map of Connecticut Oil & Gas Fracking Health & Safety Issues, http://www.drillingmaps.com/connecticut.html#.VilePvlVhBc

Review of Historic Topographic Maps

Historic topographic maps from EDR's map collection were reviewed.

Review of Town of Plainfield Building Permit Records

Based on information obtained from other historic sources, no building permit records for the subject property were reviewed.

Other Historic Sources

Based on information obtained during the completion of this Phase I ESA, no other historic sources were reviewed.

Summary of Historic Uses

Subject Property
Based on our review of the documents listed above and summarized in Table 3 below, it appears that the subject property was mainly undeveloped woodland with a cleared area in the southeastern portion of the subject property from approximately 1934 to 1970. A building is present in the northeastern portion of the subject property from approximately 1934 to 1970; the building is no longer present by 1974. By 1986, the previously cleared area appears to be fallow; the subject property resembles its present-day configuration from 1990 to 2012. The historic topographic maps reviewed depict the subject property as undeveloped woodland with two streams traversing the property in 1893, 1915, 1943, and 1953; a structure is depicted in the northeastern portion of the subject property in 1970 and 1983. City directories and fire insurance maps were not available for the subject property.

Table 3 - Historical Use of the Subject Property

Year	Use	Source
Plainfield Pike, Plainfield, Connecticut		
1893	The subject property is depicted as vacant; a stream appears to traverse the western portion of the subject property.	Topographic Map (TM) – Moosup Quadrangle
1915	The subject property is depicted as undeveloped woodland.	TM – Moosup Quadrangle
1934	The subject property appears to be mainly undeveloped woodland, and an area in the southeastern portion of the subject property appears to be cleared.	Aerial Photograph (AP) - USGS
1941	Similar to the 1934 AP.	AP – EDR
1943	The subject property is depicted as vacant, and two streams traverse the subject property.	TM – Plainfield Quadrangle
1943	The subject property is depicted mainly as woodland, and a stream traverses the subject property.	TM – Putnam Quadrangle
1951	A building is located in the northeastern portion of the subject property, and an area in the southeastern portion of the subject property is cleared.	AP – USGS

Year	Use	Source
1953	The subject property is depicted as vacant, and two streams traverse the subject property.	TM – Plainfield Quadrangle
1969	Similar to the 1953 AP.	AP – USGS
1970 (photorevised 1953)	The subject property is depicted mainly as woodland; two streams traverse the subject property, and one structure is located in the northeastern portion of the subject property.	TM – Plainfield Quadrangle
1970	Similar to the 1969 AP.	AP – EDR
1974	Similar to the 1970 AP.	AP – USGS
1983	The subject property is depicted mainly as vacant; two streams traverse the subject property, and one structure is located in the northeastern portion of the subject property.	TM – Plainfield Quadrangle
1986	The subject property appears to be undeveloped woodland, with the previously cleared area in the southeastern portion that appears to be fallow.	AP – USGS
1990	Similar to the 1986 AP.	AP – EDR
1991	Similar to the 1990 AP.	AP – USGS/DOQQ
1996	Similar to the 1991 AP.	AP – EDR
2005	The subject property resembles its present-day configuration.	AP – USDA/NAIP
2006	Similar to the 2005 AP.	AP – USDA/NAIP
2008	Similar to the 2006 AP.	AP – USDA/NAIP
2010	Similar to the 2008 AP.	AP – USDA/NAIP
2012	Similar to the 2010 AP.	AP – USDA/NAIP

Northern Adjacent Properties (9-97 Plainfield Pike)

Based on our review of the documents listed above, it appears that the northern adjacent properties were mainly vacant, cleared woodland from approximately 1934 to 1941; by 1951 one structure appears to be located south of Plainfield Pike, and by 1969 two structures are present; by 1970 five structures are present, and from 1974 to 1990 six structures are present. From 1991 to 1996, seven structures appear to be located south of Plainfield Pike, and from 2006 to 2012, eight structures are present. In addition, from 1951 to 1969, at least two buildings appear to be located adjacent to the north of Plainfield Pike. From 1970 to 1986, four buildings appear to be located adjacent to the north of Plainfield Pike, and from 1990 to 2012, three buildings are present. The historic topographic maps reviewed depict the northern adjacent properties as mainly undeveloped woodland and marsh, with two structures located south of Plainfield Pike in 1915, and five structures present in 1970 and 1983. In addition, two structures were located north of Plainfield Pike in 1893, 1915, and 1943; four structures were present in 1953 and 1983; three structures were present in 1970. City directories available for the northern adjacent properties indicate that 33 through 97 Plainfield Pike were occupied by residents and a church from approximately 1992 to 2013. In addition, 9 Plainfield Pike was occupied by the Connecticut Department of Transportation in 1995, 2003, and 2008; 78 Plainfield Pike was occupied by BST Systems in 2003 and 2008.

Eastern Adjacent Properties (91 and 107 Plainfield Pike)
Based on our review of the documents listed above, it appears that the eastern adjacent properties were developed with two buildings and eight smaller structures from approximately 1934 to 1941; from 1951 to 1974, four buildings and one smaller structure appear to be present. From 1986 to 2012, three buildings appear to be located on the eastern adjacent properties. The historic topographic maps reviewed depict the eastern adjacent properties as undeveloped woodland in 1893, 1915, and 1943; four structures were located on the eastern adjacent properties in 1953, five structures were present in 1970, and four structures were present in 1983. City directories available for the eastern adjacent properties indicate that 91 and 107 Plainfield Pike were occupied by residents from 1995 to 2013.

Southern Adjacent Properties
Based on our review of the documents listed above, it appears that the southern adjacent properties were undeveloped woodland from approximately 1934 to 2012. The historic topographic maps reviewed southern adjacent properties as mainly undeveloped woodland in 1893, 1915, 1943, 1953, 1970, and 1983. City directories were not available for the southern adjacent properties.

Western Adjacent Properties
Based on our review of the documents listed above, it appears that the western adjacent properties were undeveloped woodland from approximately 1934 to 1951; by 1969, Interstate 395 was developed along with a trailer park and agricultural fields to the west of the Interstate through 2012. The historic topographic maps reviewed depict the western adjacent properties as undeveloped woodland in 1893, 1915, and 1943; Interstate 395 was depicted adjacent to the west of the subject property in 1953, 1970, and 1983, followed by a trailer park. Fire insurance maps were not available for the western adjacent properties. City directories were not provided by EDR for the western adjacent properties.

Gaps in Historical Sources

Several gaps of greater than 5 years were identified in the historical records reviewed, from 1893 to 1915, from 1915 to 1934, from 1934 to 1941, from 1943 to 1951, from 1953 to 1969, from 1974 to 1983, and from 1996 to 2005. These gaps are considered insignificant because the subject property use appears to be similar prior to and following the gaps.

INTERVIEWS

Rincon Consultants performed interviews regarding the subject property and surrounding areas. The purpose of the interview was to discuss current and historical subject property conditions and to obtain information indicating the presence of recognized environmental conditions in connection with the property.

INTERVIEW WITH OWNER

An interview questionnaire was provided to the subject property owner prior to the site reconnaissance. Ms. Rachel Rubin, co-trustee of the Sheppard-Stener Trust, completed the questionnaire on October 30, 2015. A copy of the completed questionnaire is included in Appendix 1. The following information is based on information obtained during our review of the completed questionnaire.

Ms. Rubin indicated the following:

- The subject property and/or adjacent properties were previously used as a farm.
- The subject property is currently vacant land.
- The northern adjacent property is Plainfield Pike.
- The eastern adjacent property is currently occupied by a warehouse building.
- The current owner of the subject property is the Sheppard-Stener Trust, with Rachel Rubin and Sherry Wiener as co-trustees.
- They obtained ownership of the subject property on January 31, 1983.
- The former owner of the subject property was Herman Sheppard and Stener.
- The subject property is not serviced by any utility providers.
- There is no Title Report available for the subject property.

Ms. Rubin indicated she is unaware of the following:

- The current uses of the southern and western adjacent properties
- The previous uses of the subject property and adjacent properties

The property owner indicated she is unaware of the presence of industrial drums, storage tanks (above or below ground), fill dirt, pits, ponds, lagoons, sumps, clarifiers, solvent degreasers, stained soil, hazardous materials or hazardous wastes on the site.

The property owner indicated that she is not aware of any pending, threatened, or past litigation or administrative proceedings relevant to hazardous substances or petroleum products in, on, or from the property. In addition, she is not aware of any notice from any government entity regarding any possible violation of environmental laws or possible liability relating to hazardous substances or petroleum products.

INTERVIEW WITH SITE MANAGER

A site manager for the subject property was not identified during the completion of this Phase I ESA.

INTERVIEWS WITH OCCUPANTS

Because the subject property is undeveloped woodland, no occupants were interviewed as part of this research effort.

INTERVIEWS WITH LOCAL GOVERNMENT OFFICIALS

During a telephone conversation with Ms. Joanna Burnham of the DEEP's UST and Petroleum Division on November 10, 2015, Rincon Consultants obtained information regarding an adjacent LUST site discussed in the Additional Environmental Sources section above.

In addition, Rincon contacted Mr. Paul Clark and Mr. Kevin Neary of the DEEP Remediation Division on November 10, 2015 and left voicemails for both contacts requesting additional information on an adjacent and a nearby LUST site; a response has not been received as of the date of this report.

INTERVIEWS WITH OTHERS

Rincon did not attempt to interview neighboring property owners or others as part of this research effort.

SITE RECONNAISSANCE

Rincon Consultants performed a reconnaissance of the subject property on October 21, 2015. The purpose of the reconnaissance was to observe existing subject property conditions and to obtain information indicating the presence of recognized environmental conditions in connection with the property.

METHODOLOGY AND LIMITING CONDITIONS

The site reconnaissance was conducted by 1) observing the subject property from public thoroughfares, 2) observing the adjacent properties from public thoroughfares, and 3) observing the subject property from adjacent roads and walking paths.

Because the subject property is covered with undeveloped woodlands, the subject property was inaccessible. However, the subject property was observed from vantage points along Highway 395 and Plainfield Pike.

CURRENT USE OF THE PROPERTY AND ADJACENT PROPERTIES

The subject property is currently dense undeveloped woodlands. Adjacent properties include BST Systems, Inc., Department of Transportation Maintenance Center, a church, apartments, Highway 395 and vacant, undeveloped woodlands.

PAST USE OF THE PROPERTY AND ADJACENT PROPERTIES

Based on our site reconnaissance, past uses at the subject property and adjacent properties are not readily apparent, with the exception of an eastern adjacent property. A sign on the building located on the eastern adjacent property indicated that it was formerly "Michalski's Mill Flea Market." The building is now vacant.

CURRENT OR PAST USES IN THE SURROUNDING AREAS

The subject property is surrounded by residential, commercial, and industrial land uses and vacant land as detailed in the Site Description section of this report. Past uses of the surrounding area are not readily apparent based on the site reconnaissance, with the exception of the former flea market to the east of the subject property.

GEOLOGIC, HYDROGEOLOGIC, HYDROLOGIC AND TOPOGRAPHIC CONDITIONS

Geologic, hydrogeologic, hydrologic and topographic information are as previously stated in the Physical Settings Section of this report.

GENERAL DESCRIPTION OF STRUCTURES

The subject property is vacant, undeveloped land. There are no onsite structures.

INTERIOR AND EXTERIOR OBSERVATIONS

Storage Tanks

During the site reconnaissance, above-ground storage tanks or evidence of underground storage tanks were not observed.

Drums

During the site reconnaissance, no drums were observed on the subject property.

Hazardous Substances and Petroleum Products

No hazardous substances or petroleum products were identified at the subject property.

Unidentified Substance Containers

Unidentified substance containers or unidentified containers that might contain hazardous substances were not observed during the site reconnaissance.

Odors

During the site reconnaissance, Rincon did not identify any strong, pungent, or noxious odors.

Pools of Liquid

During the site reconnaissance, Rincon did not identify any pools of liquid including standing surface water. In addition, sumps containing liquids likely to be hazardous substances or petroleum products were not observed.

Indications of Polychlorinated Biphenyls (PCBs)

Indications of PCBs were not identified on the subject property during the site reconnaissance.

Other Conditions of Concern

During the site reconnaissance Rincon did not note any of the following:

- stains or corrosion
- clarifiers and sumps
- degreasers/parts washers
- pits, ponds, and lagoons
- stained soil or stained pavement
- stressed vegetation
- solid waste/debris
- waste water
- wells
- septic systems/effluent disposal system

EVALUATION

FINDINGS

Known or suspect environmental conditions associated with the property include the following:

- Nearby battery manufacturing facility
- Adjacent Connecticut Department of Transportation maintenance garage

OPINIONS

A. ***Nearby battery manufacturing facility -*** This property, occupied by BST Systems, Inc. is located approximately 100 feet to the northwest of the subject property across Plainfield Pike Road. According to their website, BST Systems, Inc. is "*a successful, engineering oriented, high-technology business, dedicated to the design, development and manufacture of high-energy alkaline electrochemical cells, batteries and support electronic equipment. Established in January 1983, BST has specialized in the manufacture of rechargeable silver-zinc cells and batteries. Currently BST is expanding the Company's focus to include other battery chemistries, including lithium ion, as well as various associated products. BST is continuing to expand its Research & Development department and is conducting R&D in a number of electro-chemistries, including silver zinc improvement.*" According to the EDR report, hazardous waste relating to the onsite manufacture of batteries and other electrochemical products is generated onsite and transported offsite at least once yearly from at least 1984 to 2014. None of the listings are indicative of a hazardous materials release on the site. Therefore, the nearby battery manufacturing facility is considered a *de minimis condition.*

B. ***Adjacent Connecticut Department of Transportation maintenance garage –*** This property, occupied by the Connecticut DOT Maintenance Garage, is located adjacent to the north of the northwestern portion of the subject property. According to the EDR report, hazardous

waste generated by the onsite facility is transported offsite, and the facility holds wastewater and stormwater permits for vehicle maintenance activities.

The CT SPILLS database listing for this property indicates that a release of gasoline affected the soil onsite in 1998, a 3,000-gallon UST was removed and "routine changed due to age," contaminated soils were noted, contamination was to be removed, and a "sheen on groundwater" was noted as well.

The Connecticut Leaking Underground Storage Tank (CT LUST) database for this property indicates that a release of motor fuel from a UST occurred onsite in 1998, the tank was removed and soil was excavated, soil and groundwater samples were collected, and the case status was "cleanup initiated" as of July 2013. According to Ms. Joanna Burnham of the DEEP's UST and Petroleum Division during a telephone conversation with Rincon Consultants on November 10, 2015, a 1,000-gallon UST was removed from the site in 1991 and the report was written in 1998; case closure was requested but additional information was required at the time of the request. Another CT LUST database listing for this property indicates that the status for a 1989 release of commercial heating fuel greater than 2,100 gallons is "completed."

The Connecticut Contaminated or Potentially Contaminated Sites (CT CPCS) database includes "hazardous waste facilities" in Connecticut. The listing for this property indicates that the property is a LUST site, cleanup was initiated, and remediation was started. Another CT CPCS database listing for this property indicates that the onsite LUST status is "completed" per the DEEP's significant hazard definition. Rincon contacted Mr. Paul Clark and Mr. Kevin Neary of the DEEP Remediation Division on November 10, 2015 and left voicemails for both contacts requesting additional information on this site; a response has not been received as of the date of this report.

Based on the nature of the listings and the proximity of the site to the subject property, the adjacent Connecticut DOT maintenance garage is considered a *potential Recognized Environmental Condition (REC)*.

CONCLUSIONS

Rincon has performed a Phase I ESA in general conformance with the scope and limitations of ASTM E 1527-13 for the property located at Plainfield Pike, Plainfield, Connecticut. This assessment has revealed evidence of one potential Recognized Environmental Condition in connection with the subject property as follows:

Potential Recognized Environmental Condition

1. Adjacent Connecticut Department of Transportation maintenance garage

RECOMMENDATIONS

To evaluate the potential subject property impact associated with the adjacent Connecticut DOT maintenance garage, Rincon recommends reviewing any records available at the DEEP's Remediation Division to determine whether remediation for the site was completed and to determine the status of the two known release cases (LUST #31140/SPILLS #9800659 and LUST #29422).

Based on our review of historical sources, it appears that a structure was present in the northeastern portion of the subject property from approximately 1934 to 1970. Although not considered a REC, former building foundations and used building materials may be present in this area.

DEVIATIONS

A lien search and chain of title review were not completed as part of this assessment. Other deviations from ASTM Practice were not encountered during the completion of this Phase I ESA.

REFERENCES

The following published reference materials were used in preparation of this Phase I ESA:

Environmental database: Environmental Data Resources (EDR) report dated October 9, 2015.

Geology: Connecticut Department of Environmental Protection, State Geological and Natural History Survey of Connecticut, and Michael Bell, *Bulletin 110, The Face of Connecticut: People, Geology, and the Land*, 1985: http://www.tmsc.org/face_of_ct/index.html; USGS Mineral Resources Online Spatial Data database, https://mrdata.usgs.gov/geology/state/state.php?state=CT; United States Department of Agriculture (USDA), National Resources Conservation Service (NRCS), *Web Soil Survey (WSS)*: http://websoilsurvey.nrcs.usda.gov/app/.

Groundwater: USGS Mineral Resources Online Spatial Data database, https://mrdata.usgs.gov/geology/state/state.php?state=CT; USGS Groundwater Watch Long-Term Groundwater Data Network, http://groundwaterwatch.usgs.gov/Net/OGWNetworkLTN.asp?ncd=ltn&a=1&d=1.

Topography: USGS topographic map (1983, Plainfield Quadrangle).

Oil and gas records: Drilling Maps: Map of Connecticut Oil & Gas Fracking Health & Safety Issues, http://www.drillingmaps.com/connecticut.html#.VilePvlVhBc; EDR Report dated October 9, 2015.

Aerial photographs: Photos provided by EDR.

Fire insurance maps: Maps provided by EDR.

City directory listings: Listings provided by EDR.

Historic topographic maps: Maps provided by EDR.

Parcel data: Northeastern Connecticut Council of Governments online GIS Map Viewer, http://www.http://neccog.org/gis/.

SIGNATURES OF ENVIRONMENTAL PROFESSIONALS

The qualified environmental professionals that are responsible for preparing the report include Walt Hamann and Sarah A. Larese. Their qualifications are summarized in the following section.

"We declare that, to the best of our professional knowledge and belief, we meet the definition of Environmental Professional as defined in 312.10 of 40 CFR 312. We have the specific qualifications based on education, training and experience to assess a property of the nature, history, and setting of the subject property. We have developed and performed appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312."

Signature	November 18 2015 Date
Walt Hamann, PG, CEG, CHG Name	Vice President Title
Signature	November 18, 2015 Date
Sarah A. Larese Name	Senior Environmental Scientist Title

QUALIFICATIONS OF ENVIRONMENTAL CONSULTANTS

The environmental consultants responsible for conducting this Phase I ESA and preparing the report include Walt Hamann, Sarah A. Larese, Lauren Kodama Roenicke, and Savanna Vrevich. Their qualifications are summarized below.

Environmental Professional Qualifications	X2.1.1 (2) (i) - Professional Engineer or Professional Geologist License or Registration, and 3 years of full-time relevant experience	X2.1.1 (2) (ii) - Licensed or certified by the Federal Government, State, Tribe, or U.S. Territory to perform environmental inquiries	X2.1.1 (2) (iii) – Baccalaureate or Higher Degree from and accredited institution of higher education in a discipline of engineering or science and the equivalent of 5 years of full-time relevant experience	X2.1.1 (2) (iii) – Equivalent of 10 years of full-time relevant experience
Walt Hamann	PG, CHG, CEG		MS Geology	30 years
Sarah A. Larese			BA Environmental Studies	16 years
Lauren Kodama Roenicke			BS Environmental Studies	3 years
Savanna Vrevich			BS Environmental Studies	1 year

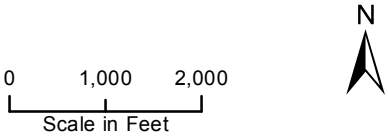
Walt Hamann, PG, CEG, CHG, is a Principal and Senior Geologist with Rincon Consultants. He holds a Bachelor of Arts degree in geology from the University of California, Santa Barbara and a Master of Science degree in geology from the University of California, Los Angeles. He has over 30 years of experience conducting assessment and remediation projects and has prepared or overseen the preparation of hundreds of Phase I and Phase II Environmental Site Assessments throughout California. Mr. Hamann is a Professional Geologist (#4742), Certified Engineering Geologist (#1635), and Certified Hydrogeologist (#208) with the State of California.

Sarah A. Larese is a Senior Environmental Scientist with Rincon Consultants. She holds a Bachelor of Science degree in environmental studies from the University of California, Santa Barbara, California. Ms. Larese has experience in development, implementation and project management of environmental assessment and remediation projects, especially relating to underground storage tanks. Ms. Larese's responsibilities at Rincon include implementation of Phase I and II Environmental Site Assessments as well as conducting site remediation field activities and preparation of environmental reports. She has 16 years of experience conducting research, assessment and remediation projects.

Lauren G. Kodama Roenicke is an Environmental Scientist with Rincon Consultants. She holds a Bachelor of Science degree in Environmental Studies with an outside concentration of Ecology, Evolution, and Marine Biology from the University of California, Santa Barbara. Ms. Kodama has experience working on Phase I Environmental Site Assessments for a variety of commercial, rural, and industrial properties. In addition, Ms. Kodama has been involved in working on large scale, multi-site projects. Ms. Kodama's responsibilities at Rincon include implementation of Phase I and Phase II Environmental Site Assessment Reports.

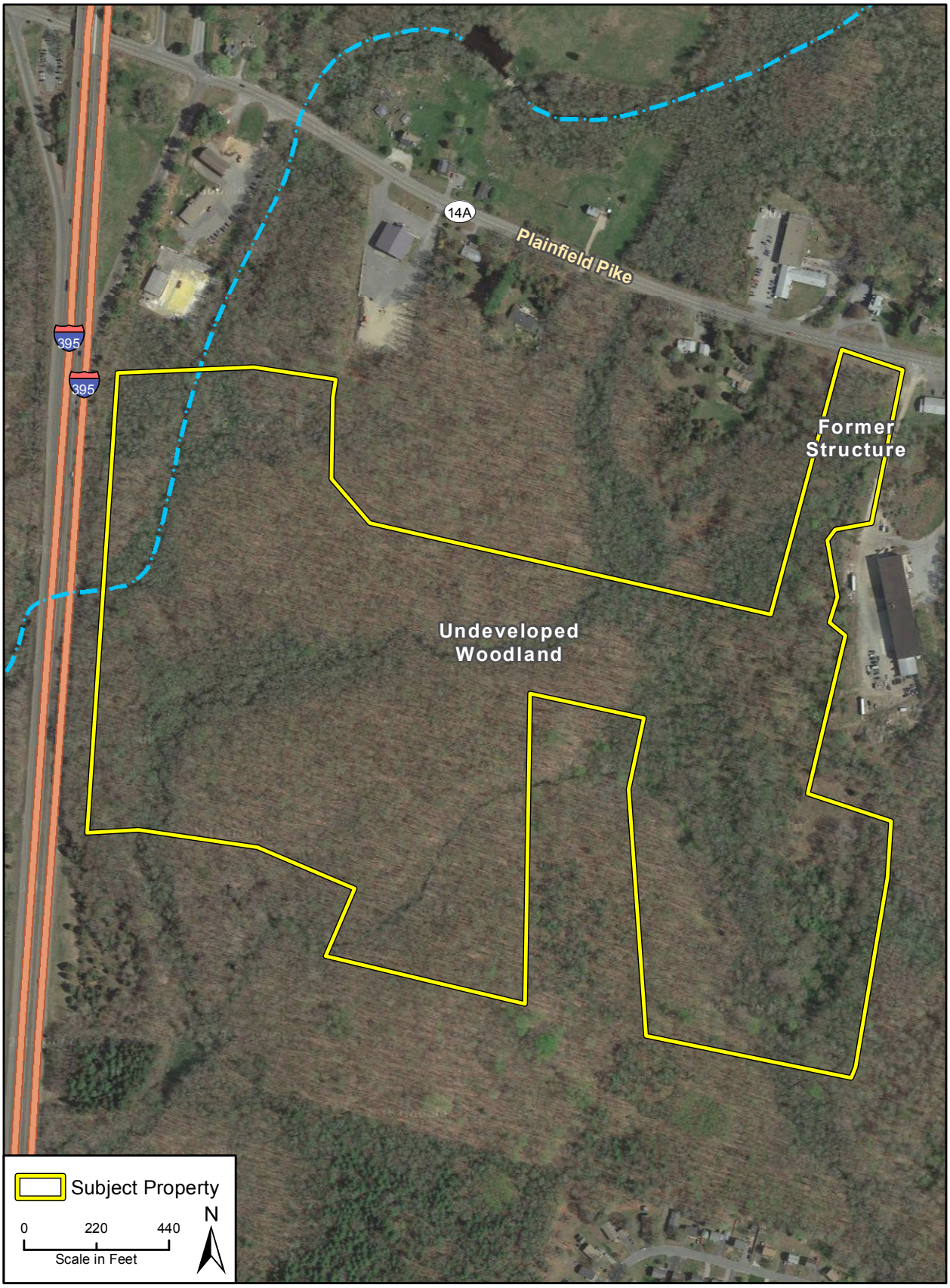
Savanna Vrevich is an Environmental Scientist with Rincon Consultants. She holds a Bachelor of Science degree in Environmental Studies with an outside concentration of Ecology, Evolution, and Marine Biology from the University of California, Santa Barbara. Ms. Vrevich's responsibilities at Rincon include implementation of Phase I Environmental Site Assessment Reports.

Imagery provided by National Geographic Society, ESRI and its licensors © 2015. The topographic representation depicted in this map may not portray all of the features currently found in the vicinity today and/or features depicted in this map may have changed since the original topographic map was assembled.



Vicinity Map

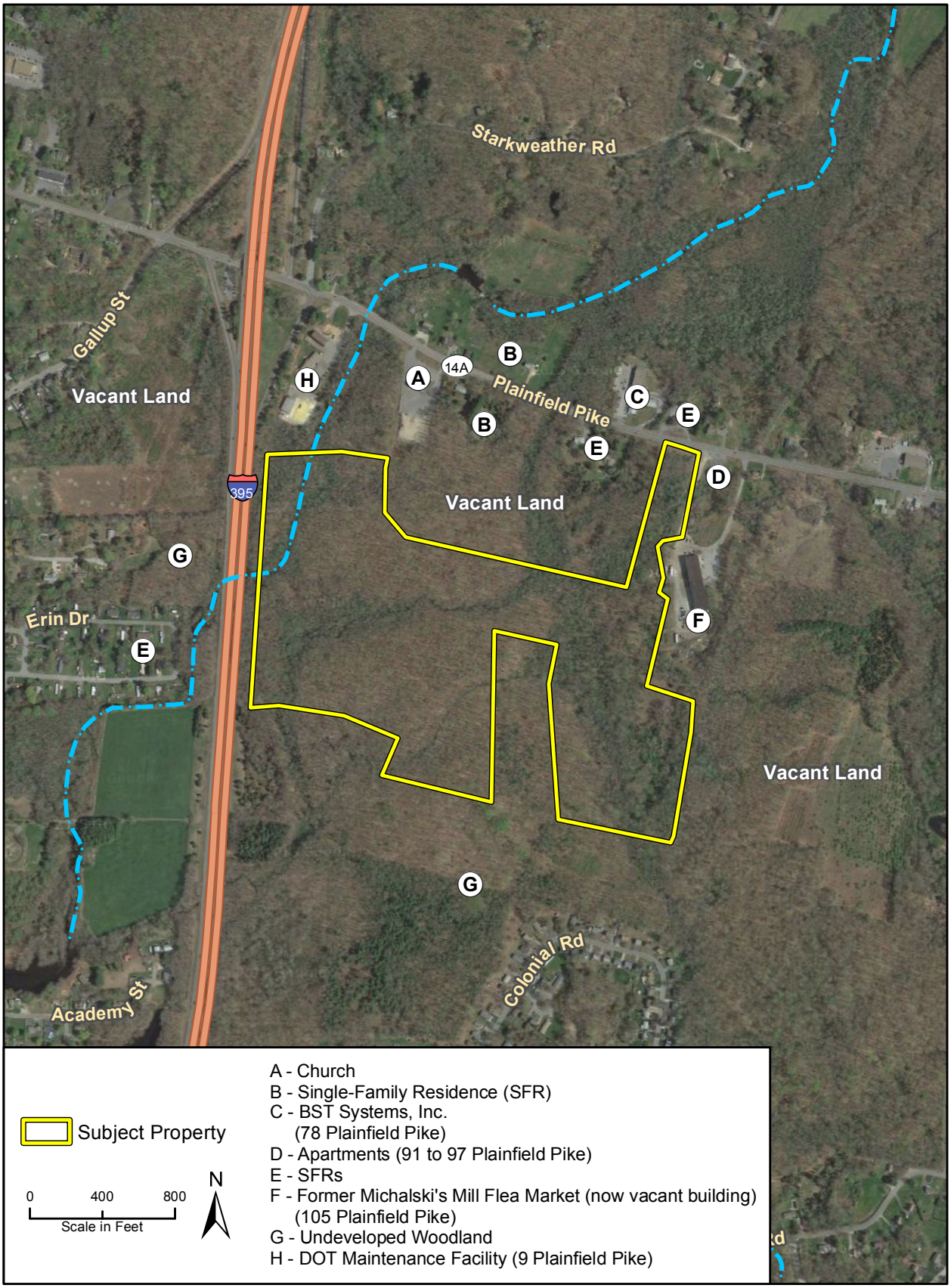
Figure 1



Imagery provided by Google and its licensors © 2015.

Site Map

Figure 2



Adjacent Land Use Map

Figure 3

Photograph 1: View of woodlands on the northern portion of the subject property, facing south.

Photograph 2: View of Plainfield Pike along the northern portion of the subject property, facing west.

Photograph 3: View of woodlands on the subject property.

Photograph 4: View of BST Systems, Inc., adjacent to the north of the subject property (across Plainfield Pike), facing northwest.

Photograph 5: View of apartments adjacent to the east of the subject property, facing southeast.

Photograph 6: View of the former flea market building adjacent to the east of the subject property, facing southwest.

Figure 4

HIGHLAND SOILS, LLC

February 2, 2016

Steve Broyer
Ecos Energy
222 S 9th St., Suite 1600
Minneapolis, MN 55402

RE: PLAINFIELD PIKE SOLAR
91 PLAINFIELD PIKE
PLAINFIELD, CT

Dear Steve:

The inland wetland boundaries on the above-referenced property were field delineated in October 2015. The wetlands were field delineated in accordance with the standards of the National Cooperative Soil Survey and the definition of wetlands as found in the Connecticut General Statutes, Chapter 440, Section 22A-38. I have reviewed the plans prepared by your office and have found the representation of the field delineated wetlands to be substantially correct.

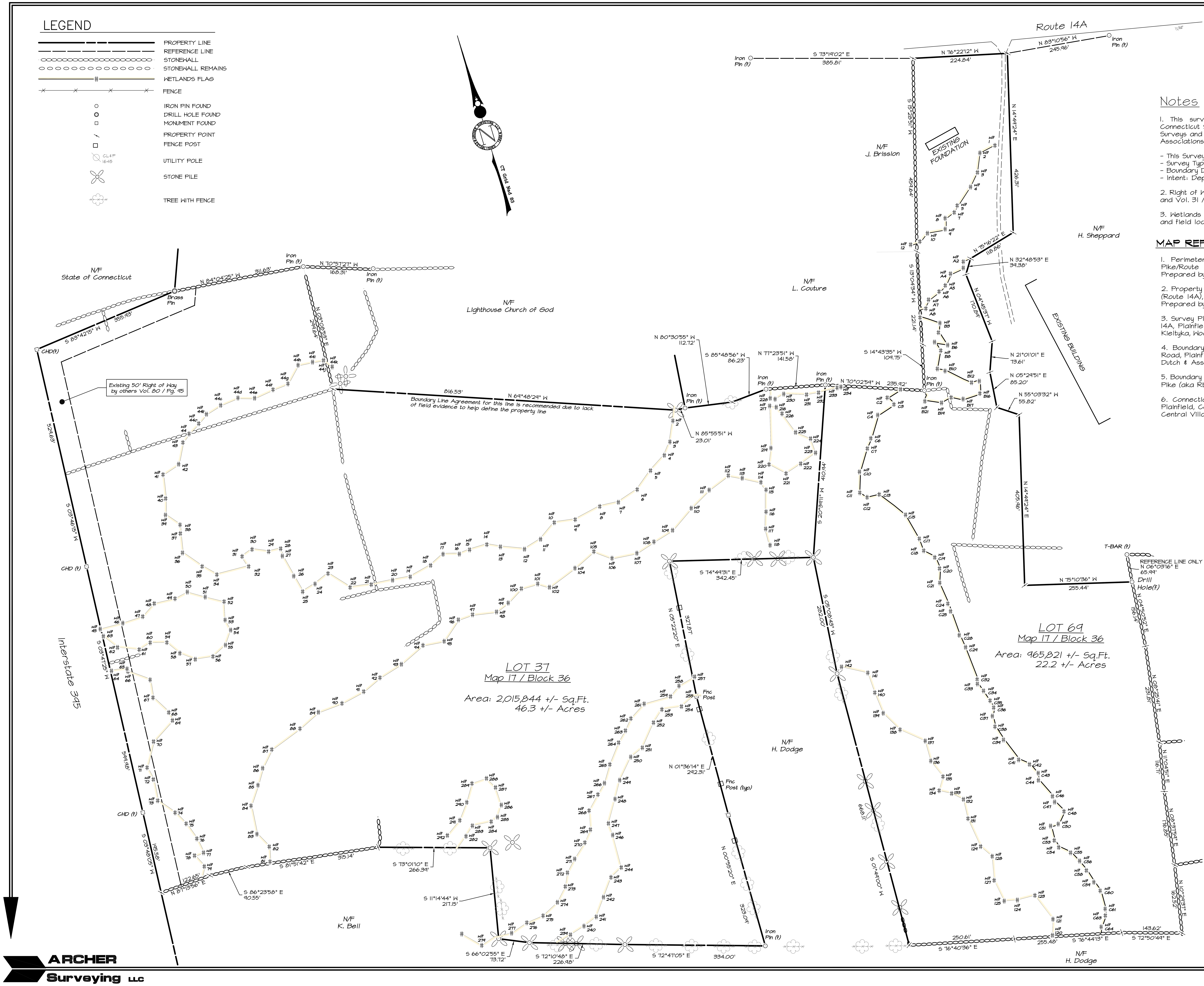
I am currently out of the State and will submit a more detailed report once I am able to revisit the site and collect more site specific detailed information.

If you have any questions, or require additional information, please call me at (860) 742-5868.

Very truly yours,

John P. Ianni

John P. Ianni, M.S.
Professional Soil Scientist
CPESC



Notes

1. This survey has been prepared pursuant to the Regulations of Connecticut State Agencies Section 20-300b-20 and the "Standards for Surveys and Maps in State of Connecticut" as adopted by the Connecticut Associations of Land Surveyors, Inc. on September 26, 1996

- This Survey conforms to a Class "A-2" Horizontal Accuracy
- Survey Type: Perimeter Survey
- Boundary Determination: Resurvey
- Intent: Depict Existing Conditions with Respect to Property Lines

2. Right of Ways exist of Parcels as stated in deeds Vol. 80 / Pg. 95 and Vol. 31 / Pg 245

3. Wetlands were delineated in the field by Joseph Theroux & John Ianl and field located by Archer Surveying LLC.

MAP REFERENCE:

1. Perimeter Survey Prepared for Sheppard/Steuer Trust. Plainfield Pike/Route 14A, Plainfield, Connecticut, Scale: 1"=100', Dated: May 2015, Prepared by Archer Surveying LLC

2. Property Survey Prepared for Leon and Sally Couture, Plainfield Pike (Route 14A), Plainfield, Connecticut, Scale: 1"=40', Date: December 2002, Prepared by: Eric Seltz L.S.

3. Survey Plan, Prepared for Gertrude Sheppard & Colman Steur, Route 14A, Plainfield, Connecticut, Scale: 1"=50' Date: June 1982, Prepared by: Kleltyka, Woodis & Pike

4. Boundary Survey Prepared for Fleet National Bank, Plainfield Pike Road, Plainfield, Connecticut, Scale: 1"=40', Date: Feb. 1997. Prepared by: Dutch & Associates

5. Boundary Survey, Prepared for Rex Project Management, Inc. Plainfield Pike (aka Rte 14A) Plainfield, Connecticut, Prepared by Fuss & O'Neill Inc

6. Connecticut State Highway Department, Right of Way Map, Town of Plainfield, Connecticut Turnpike, From Lathrop Road Northeasterly to the Central Village-Moosup, Project # 108-19

To My Knowledge and Belief this Map is substantially Correct as noted hereon.

Paul M. Archer LLS #70013 Date

No Certification is expressed or implied unless this map bears the embossed seal of the land surveyor whose signature appears hereon.

Perimeter Survey

Prepared For:
ECOS Renewable Energy
Plainfield Pike / Route 14A
Plainfield, Connecticut

DRAWING SCALE: 1"=100' 0 100 200

ARCHER Surveying LLC
18 Providence Road, Brooklyn, CT
(860) 779-2240

Sheet No.	1 OF 1	Project No.	1306	Date:	November 2015

Petitioner submitted a Request for Natural Diversity Database (NDDB) to the Connecticut Department of Energy and Environmental Protection on November 24, 2015. As of the date of this Petition for Declaratory Ruling, Petitioner has not received a response from DEEP regarding this request. Upon receipt of a determination letter, Petitioner will provide the Siting Council with a copy. Attached is a copy of the request that was submitted to DEEP for the NDDB review.

Connecticut Department of
Energy & Environmental Protection
Bureau of Natural Resources
Wildlife Division

CPPU USE ONLY
App #:_____
Doc #:_____
Check #: No fee required
Program: Natural Diversity Database **Endangered Species**
Hardcopy _____ **Electronic** _____

Request for Natural Diversity Data Base (NDDB) State Listed Species Review

Please complete this form in accordance with the instructions (DEEP-INST-007) to ensure proper handling of your request.
There are no fees associated with NDDB Reviews.

Part I: Preliminary Screening & Request Type

Before submitting this request, you must review the most current Natural Diversity Data Base "State and Federal Listed Species and Significant Natural Communities Maps" found on the DEEP website. These maps are updated twice a year, usually in June and December.

Does your site, including all affected areas, fall in an NDDB Area according to the map instructions:

☐ Yes ☒ No **Enter the date** of the map reviewed for pre-screening: **September 2015**

This form is being submitted for a :

☒ *New* NDDB request ☐ *Renewal/Extension* of a NDDB Request, ***without*** *modifications and within* ***one year*** *of issued NDDB determination* (no attachments required) [*CPPU Use Only - NDDB-Listed Species Determination* # 1736]	☐ *New* **Safe Harbor Determination** (optional) must be associated with an application for a GP for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities ☐ *Renewal/Extension* of an existing Safe Harbor Determination ☐ With modifications ☐ Without modifications (no attachments required) [*CPPU Use Only - NDDB-Safe Harbor Determination* # 1736]
Enter NDDB Determination Number for Renewal/Extension:	Enter Safe Harbor Determination Number for Renewal/Extension:

Part II: Requester Information

***If the requester is a corporation, limited liability company, limited partnership, limited liability partnership, or a statutory trust, it must be registered with the Secretary of State. If applicable, the name shall be stated **exactly** as it is registered with the Secretary of State. Please note, for those entities registered with the Secretary of State, the registered name will be the name used by DEEP. This information can be accessed at the Secretary of the State's database CONCORD.*
(www.concord-sots.ct.gov/CONCORD/index.jsp)

If the requester is an individual, provide the legal name (include suffix) in the following format: First Name; Middle Initial; Last Name; Suffix (Jr, Sr., II, III, etc.).

If there are any changes or corrections to your company/facility or individual mailing or billing address or contact information, please complete and submit the Request to Change company/Individual Information to the address indicated on the form.

1. Requester*

Company Name: **Windham Solar LLC**

Contact Name: **Blake Nicholson**

Address: **222 South 9th St Suite 1600**

City/Town: **Minneapolis** State: **MN** Zip Code: **55402**

Business Phone: **612-326-5116** ext.

E-mail: **blake.nicholson@ecosrenewable.com

**By providing this email address you are agreeing to receive official correspondence from the department, at this electronic address, concerning this request. Please remember to check your security settings to be sure you can receive emails from "ct.gov" addresses. Also, please notify the department if your e-mail address changes

a) Requester can best be described as:

☐ Individual ☐ Federal Agency ☐ State agency ☐ Municipality ☐ Tribal

☒ *business entity (* if a business entity complete i through iii):

i) Check type ☐ corporation ☒ limited liability company ☐ limited partnership
☐ limited liability partnership ☐ statutory trust ☐ Other:

ii) Provide Secretary of the State Business ID #: 1158009 This information can be accessed at the Secretary of the State's database (CONCORD). (www.concord-sots.ct.gov/CONCORD/index.jsp)

iii) ☐ Check here if your business is **NOT** registered with the Secretary of State's office.

b) Acting as (Affiliation), pick one:

☐ Property owner ☐ Consultant ☐ Engineer ☒ Facility owner ☐ Applicant

☐ Biologist ☐ Pesticide Applicator ☐ Other representative:

2. List Primary Contact to receive Natural Diversity Data Base correspondence and inquiries, if different from requester.

Company Name:

Contact Person: Title:

Mailing Address:

City/Town: State: Zip Code:

Business Phone: ext.

**E-mail:

Part III: Site Information

This request can only be completed for one site. A separate request must be filed for each additional site.

1. SITE NAME AND LOCATION

Site Name or Project Name: **Plainfield Pike Solar**

Town(s): **Plainfield**

Street Address or Location Description:
Map 17, Block 36, Lots 37 and 69

Size in acres, or site dimensions: **69 acres**

Latitude and longitude of the center of the site in decimal degrees (e.g., 41.23456 -71.68574):

Latitude: **41.67922** Longitude: **-71.90516**

Method of coordinate determination (check one):

☐ GPS ☐ Photo interpolation using CTECO map viewer ☒ Other (specify): **Google Earth**

2a. Describe the current land use and land cover of the site.

There are no structures located on the site. The land is almost entirely forested, which also contains some wetlands. The site is currently vacant.

b. Check all that apply and enter the size in acres or % of area in the space after each checked category.

☐ Industrial/Commercial _____	☐ Residential _____	☒ Forest 54
☒ Wetland 15	☐ Field/grassland _____	☐ Agricultural _____
☐ Water _____	☐ Utility Right-of-way _____	
☐ Transportation Right-of-way _____	☐ Other (specify): _____	

Part IV: Project Information

1. PROJECT TYPE:

Choose Project Type: Choose Type From Dropdown List , If other describe: **Solar Energy Facility**

2. Is the subject activity limited to the maintenance, repair, or improvement of an existing structure within the existing footprint? ☐ Yes ☒ No If yes, explain.

Part IV: Project Information (continued)

3. Give a detailed description of the activity which is the subject of this request and describe the methods and equipment that will be used. Include a description of steps that will be taken to minimize impacts to any known listed species.

   Site preparation for the solar energy facility will include clearing of vegetation within the Project area, in addition to minimal surface grading required to install the access road and for stormwater management. Other site preparation activities include survey/staking, stabilization, installation of permiter security fence, and trenching for underground conduit. Construction of the solar photovoltaic facility will involve driving steel h-beams into the ground to support the racking system. Underground electrical cabling and wiring wil be laid in order to collect energy form the modules and deliver it to the eletrical grid. Protective devices such as fuses, switches, and breakers will also be installed. Following construction of the facility, final landscaping and ground cover stabilization will be performed. If water is required for dust control, that water will be applied regularly by water trucks. Once operational, the Project will require miminal maintenance consisting of 2-3 site visits per month by a single truck crew to perform equipment and landscaping maintenance. The Project site does not fall within a NDDB area as indicated by the map.

4. If this is a renewal or extension of an existing Safe Harbor request *with* modifications, explain what about the project has changed.

5. Provide a contact for questions about the project details if different from Part II primary contact.

   Name:

   Phone:

   E-mail:

Part V: Request Requirements and Associated Application Types

Check *one* box from either Group 1, Group 2 *or* Group 3, indicating the appropriate category for this request.

Group 1. If you check one of these boxes, complete Parts I – VII of this form and submit the required attachments A and B.

☐ Preliminary screening was negative but an NDDB review is still requested

☐ Request regards a municipally regulated or unregulated activity (no state permit/certificate needed)

☐ Request regards a preliminary site assessment or project feasibility study

☐ Request relates to land acquisition or protection

☐ Request is associated with a *renewal* of an existing permit, with no modifications

Group 2. If you check one of these boxes, complete Parts I – VII of this form and submit required attachments A, B, *and* C.

☒ Request is associated with a *new* state or federal permit application

☐ Request is associated with modification of an existing permit

☐ Request is associated with a permit enforcement action

☐ Request regards site management or planning, requiring detailed species recommendations

☐ Request regards a state funded project, state agency activity, or CEPA request

☐ **Group 3.** If you are requesting a **Safe Harbor Determination**, complete Parts I-VII and submit required attachments A, B, and D. Safe Harbor determinations can only be requested if you are applying for a GP for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities

If you are filing this request as part of a state or federal permit application(s) enter the application information below.

Permitting Agency and Application Name(s): _____

State DEEP Application Number(s), if known: _____

State DEEP Enforcement Action Number, if known: _____

State DEEP Permit Analyst(s)/Engineer(s), if known: _____

Is this request related to a previously submitted NDDB request? ☐ Yes ☒ No

If yes, provide the previous NDDB Determination Number(s), if known: _____

Part VI: Supporting Documents

Check each attachment submitted as verification that *all* applicable attachments have been supplied with this request form. Label each attachment as indicated in this part (e.g., Attachment A, etc.) and be sure to include the requester's name, site name and the date. **Please note that Attachments A and B are required for all new requests and Safe Harbor renewals/extensions with modifications.** Renewals/Extensions with no modifications do not need to submit any attachments. Attachments C and D are supplied at the end of this form.

☒ Attachment A:	**Overview Map:** an 8 1/2" X 11" print/copy of the relevant portion of a USGS Topographic Quadrangle Map clearly indicating the exact location of the site.
☒ Attachment B:	**Detailed Site Map:** fine scaled map showing site boundary and area of work details on aerial imagery with relevant landmarks labeled. (Site and work boundaries in GIS [ESRI ArcView shapefile, in NAD83, State Plane, feet] format can be substituted for detailed maps, see instruction document)
☒ Attachment C:	**Supplemental Information, Group 2 requirement (attached, DEEP-APP-007C)** ☒ Section i: Supplemental Site Information and supporting documents ☒ Section ii: Supplemental Project Information and supporting documents
☐ Attachment D:	**Safe Harbor Report Requirements, Group 3 (attached, DEEP-APP-007D)**

Part VII: Requester Certification

The requester *and* the individual(s) responsible for actually preparing the request must sign this part. A request will be considered incomplete unless all required signatures are provided.

"I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that based on reasonable investigation, including my inquiry of the individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief."

	11/23/15
Signature of Requester (a typed name will substitute for a handwritten signature)	Date
Blake Nicholson	
Name of Requester (print or type)	Title (if applicable)
Signature of Preparer (if different than above)	Date
Name of Preparer (print or type)	Title (if applicable)

Note: Please submit the completed Request Form and all Supporting Documents to:

CENTRAL PERMIT PROCESSING UNIT
DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION
79 ELM STREET
HARTFORD, CT 06106-5127

Or email request to: **deep.nddbrequest@ct.gov**

Attachment C: Supplemental Information, Group 2 requirement

Section i: Supplemental Site Information

1. Existing Conditions

Describe all natural and man-made features including wetlands, watercourses, fish and wildlife habitat, floodplains and any existing structures potentially affected by the subject activity. Such features should be depicted and labeled on the site plan that must be submitted. Photographs of current site conditions may be helpful to reviewers.

Construction of the solar array will not encroach upon the wetlands located on the parcel. Please reference the site plan for additional details.

☐ **Site Photographs (optional) attached**

☒ **Site Plan/sketch of existing conditions attached**

2. Biological Surveys

Has a biologist visited the site and conducted a biological survey to determine the presence of any endangered, threatened or special concern species ☐ Yes ☒ No

If yes, complete the following questions and submit any reports of biological surveys, documentation of the biologist's qualifications, and any NDDB survey forms.

Biologist(s) name: _____

Habitat and/or species targeted by survey: _____

Dates when surveys were conducted: _____

☐ **Reports of biological surveys attached**

☐ **Documentation of biologist's qualifications attached**

☐ **NDDB Survey forms for any listed species observations attached**

Section ii: Supplemental Project Information

1. Provide a schedule for all phases of the project including the year, the month and/or season that the proposed activity will be initiated and the duration of the activity.

   Site preparation activies (reference Part IV Project Information for more details) will last one month. Construction of the Project will take approximately two months, and systems testing an additional month. Site preparation will commences in May/June 2016 and systems testing will conclude at the end of September 2015.

2. Describe and quantify the proposed changes to existing conditions and describe any on-site or off-site impacts. In addition, provide an annotated site plan detailing the areas of impact and proposed changes to existing conditions.

   The Project will consist of two 1.0MW AC solar photoltaic facilities, with a total footprint of approximately 20 acres. Please reference the annotated site plan for areas of impact and proposed changes to existing conditions.

☒ **Annotated Site Plan attached**

Attachment D: Safe Harbor Report Requirements

Submit a report, as Attachment D, that synthesizes and analyzes the information listed below. Those providing synthesis and analysis need appropriate qualifications and experience. A request for a safe harbor determination shall include:

1. **Habitat Description and Map(s), including GIS mapping overlays, of a scale appropriate for the site, identifying:**

   - wetlands, including wetland cover types;
   - plant community types;
   - topography;
   - soils;
   - bedrock geology;
   - floodplains, if any;
   - land use history; and
   - water quality classifications/criteria.

2. **Photographs** - The report should include photographs of the site taken from the ground and also all reasonably available aerial or satellite photographs and an analysis of such photographs.

3. **Inspection** - A visual inspection(s) of the site should be conducted, preferably when the ground is visible, and described in the report. This inspection can be helpful in confirming or further evaluating the items noted above.

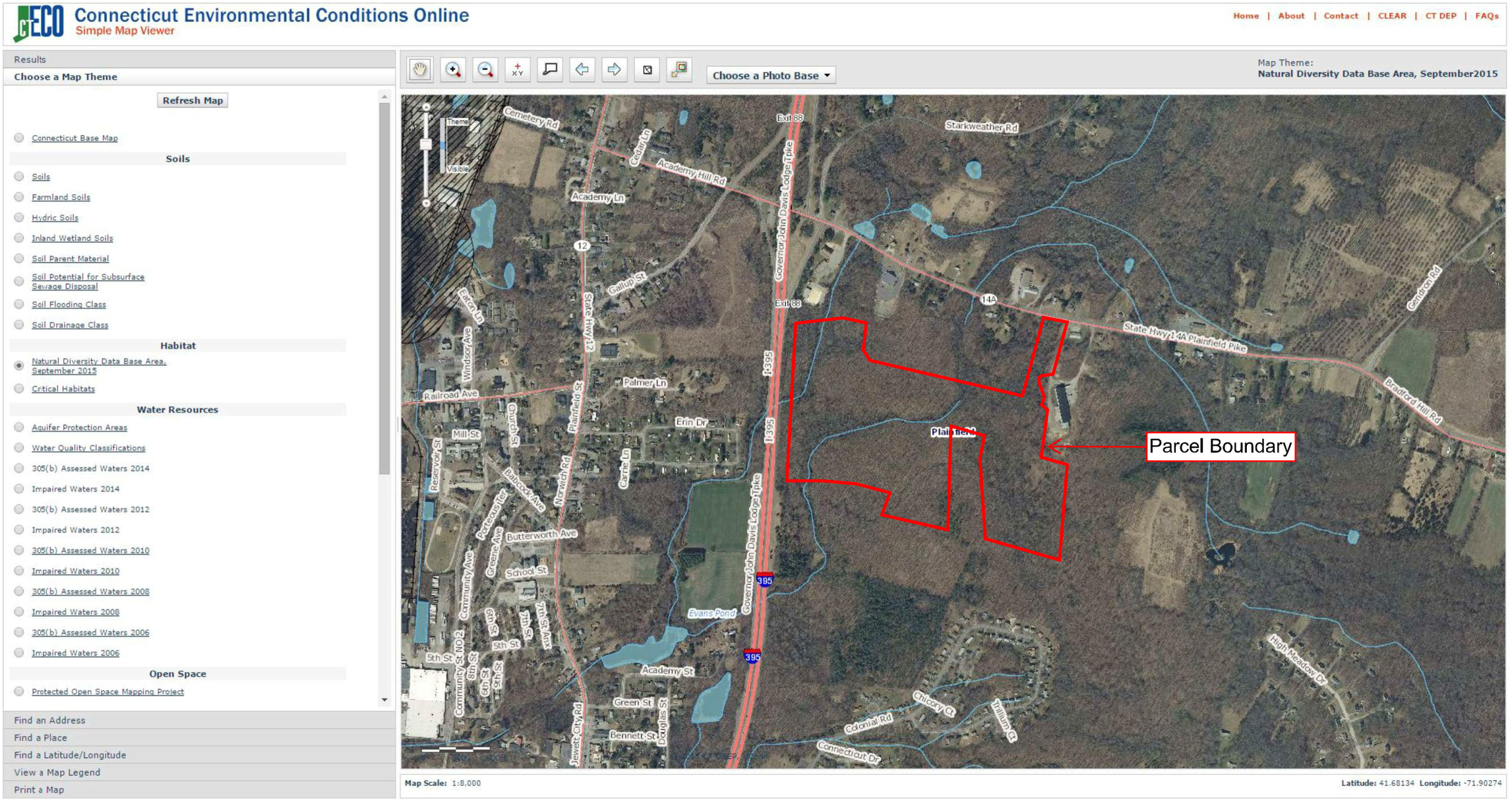
4. **Biological Surveys** - The report should include all biological surveys of the site where construction activity will take place that are reasonably available to a registrant. A registrant shall notify the Department's Wildlife Division of biological studies of the site where construction activity will take place that a registrant is aware of but are not reasonably available to the registrant.

5. **Based on items #1 through 4 above, the report shall include a Natural Resources Inventory of the site of the construction activity.** This inventory should also include a review of reasonably available scientific literature and any recommendations for minimizing adverse impacts from the proposed construction activity on listed species or their associated habitat.

6. **In addition, to the extent the following is available at the time a safe harbor determination is requested, a request for a safe harbor determination shall include and assess:**

   - Information on Site Disturbance Estimates/Site Alteration information
   - Vehicular Use
   - Construction Activity Phasing Schedules, if any; and
   - Alteration of Drainage Patterns

Requester Name: Windham Solar LLC Date: November 23, 2015 Site Name: Plainfield Pike Solar



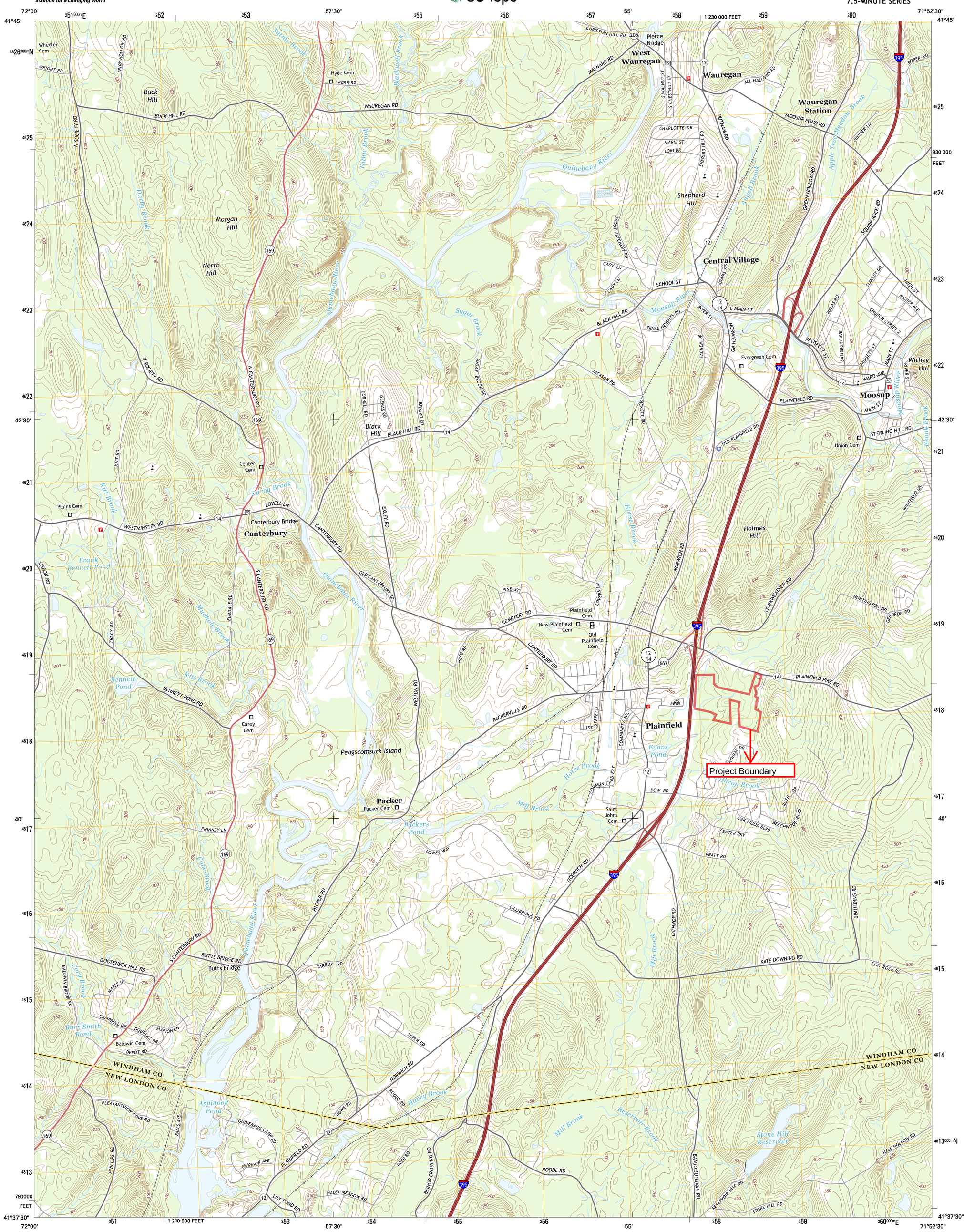
Requester Name: Windham Solar LLC Date: November 23, 2015 Site Name: Plainfied Pike Solar

USGS science for a changing world

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

The National Map US Topo

PLAINFIELD QUADRANGLE
CONNECTICUT
7.5-MINUTE SERIES



Produced by the United States Geological Survey

North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid: Universal Transverse Mercator, Zone 19T
10 000-foot ticks: Connecticut Coordinate System of 1983

This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery.....NAIP, July 2014
Roads..... HERE, ©2013 - 2014
Names.....GNIS, 2015
Hydrography.....National Hydrography Dataset, 2014
Contours.....National Elevation Dataset, 2012
Boundaries.....Multiple sources; see metadata file 1972 - 2015

UTM GRID AND 2015 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

U.S. National Grid
100,000-m Square ID
BG
Grid Zone Designation
19T

SCALE 1:24 000

1 0.5 0 KILOMETERS 1 2
1000 500 0 METERS 1000 2000
1 0.5 0 1
MILES
1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000
FEET

CONTOUR INTERVAL 10 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

This map was produced to conform with the
National Geospatial Program US Topo Product Standard, 2011.
A metadata file associated with this product is draft version 0.6.18

QUADRANGLE LOCATION

ROAD CLASSIFICATION

Expressway
Secondary Hwy
Ramp
Local Connector
Local Road
4WD
Interstate Route
US Route
State Route

1	2	3
4		5
6	7	8

1 Hampton
2 Danielson
3 East Killingly
4 Scotland
5 Oneco
6 Norwich
7 Jewett City
8 Voluntown

ADJOINING QUADRANGLES

PLAINFIELD, CT
2015

Westwood

7699 Anagram Drive
Eden Prairie, MN 55344

Main (952) 937-5150
Fax (952) 937-5822

westwoodps.com
(888) 937-5150

MEMORANDUM

Date: February 26, 2016

Re: Plainfield Solar Project – Stormwater
File 0008567

To: Steve Broyer, Ecos Energy

From: Joe Fox, Water Resources Engineer

The memo summarizes stormwater modeling completed for the Plainfield Solar Project. The site is located on the southeast intersection of the Connecticut Turnpike and Plainfield Pike just east of the City of Plainfield, CT. HydroCAD modeling software was used to establish existing and proposed discharge rates from the site. Attachment 1 shows a drainage area map. Topographic data was furnished by the client.

Existing Conditions

The site is not within a FEMA flood zone. A floodzone exists on the western boundary (fence line) of the western-most array on this site. But it does not affect the project. In existing conditions there is no impervious surface. The site is forested. Site soils are predominantly classified as A and B with smaller areas of D soils. Attachment 2 shows soils data.

Proposed Conditions

The proposed design has solar panels installed in three sections for a total of 5.98 acres of panels. Gravel access roads (1.01 acres) are proposed to service the arrays. Inverters and other associated electrical components (0.033 acres) are proposed for each solar array. The proposed ground cover beneath and around the panels is native grass. Stormwater generally runs off to the east and south from all three array sections.

Modeling Results

The site was modeled in HydroCAD as three areas, using the proposed fence line as the watershed boundaries. Site conditions are shown in Table 1. Curve Numbers were calculated based on land cover and soil type.

Table 1. Site Conditions

Project Area [ac]	16.93	Area within fence
Solar Array [ac]	5.98	
Proposed Impervious Improvements [ac]	1.34	Gravel access roads and equipment pads

The discharge rates in proposed conditions are higher than existing conditions rates in the 2-year, 10-year, and 100-year storm storms (Table 2). This is due to the ground cover change from forest to meadow. Additionally, the solar project will create impervious due to the access roads and inverter pads.

Table 2. Comparison of Discharge Rates **without** Pond

Event	**Rainfall depth [in]**	**Existing [cfs]**	**Proposed [cfs]**
2-year	3.36	2.2	5.3
10-year	5.04	9.1	14.6
100-year	7.69	24.1	32.7

The planting of meadow grasses under and around the solar array helps to mitigate discharge rates but not to the extent required. Therefore a stormwater pond is required. According to the HydroCAD model, constructing a dry pond on the south side of southwest solar array would mitigate flows sufficiently (Table 3 and Attachment 4). A pond approximately 10,000 square feet with a depth of 5 feet would achieve the required mitigation.

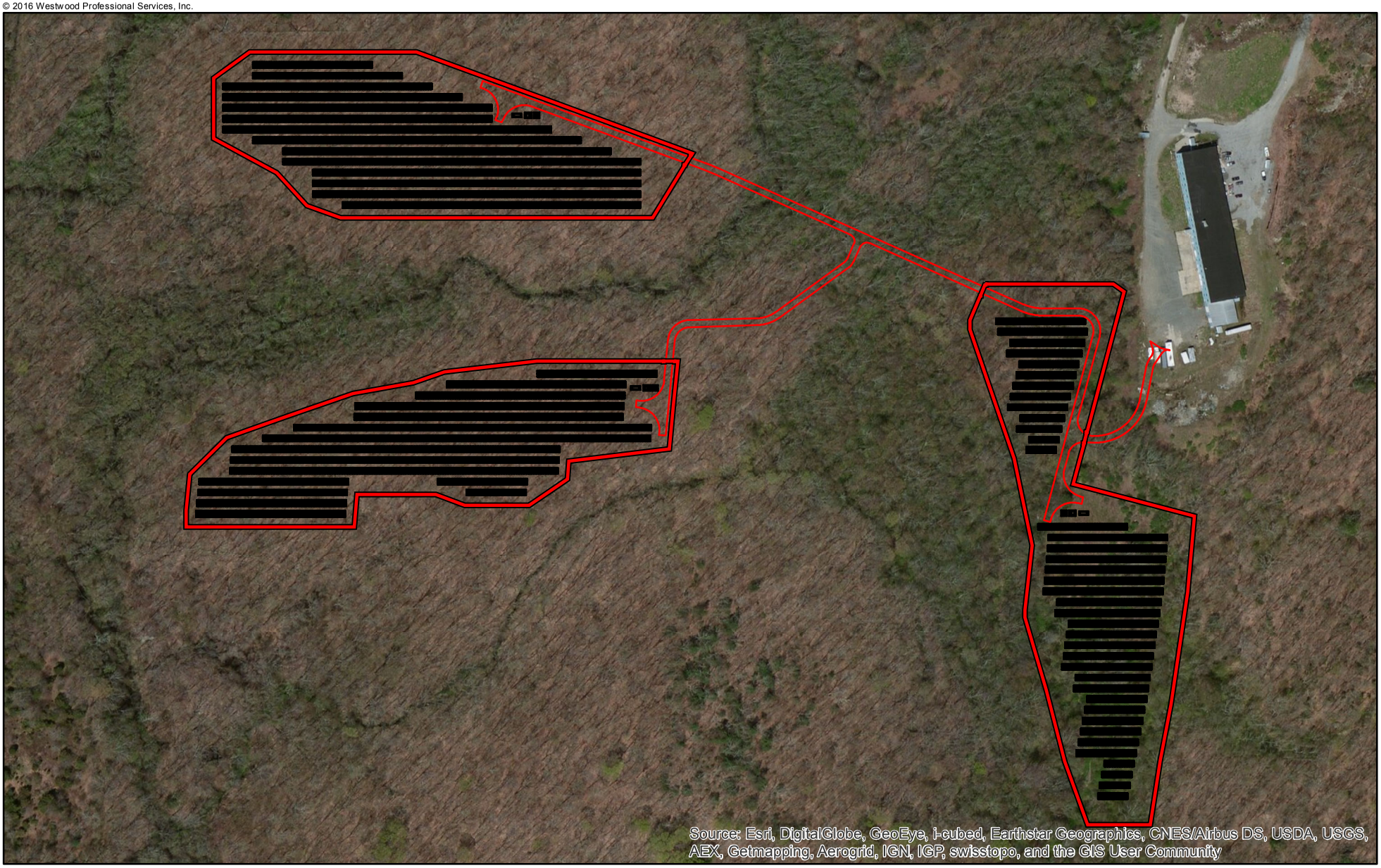
Table 3. Comparison of Discharge Rates **with** Pond

Event	**Rainfall depth [in]**	**Existing [cfs]**	**Proposed [cfs]**
2-year	3.36	2.2	1.8
10-year	5.04	9.1	6.0
100-year	7.69	24.1	17.3

Attachments

1. Drainage Map
2. Soil Information
3. Atlas 14 Precipitation Report
4. HydroCAD Report

Map Document: N:\0008567.00\GIS\0008567_Plainfield2.mxd 2/26/2016 5:51:56 PM



Data Source(s):

Plainfield Solar Project - ECOS Energy

Plainfield, Connecticut

Fence Line - Watershed Boundary

Solar Array

Access Road

N

0 100 Feet

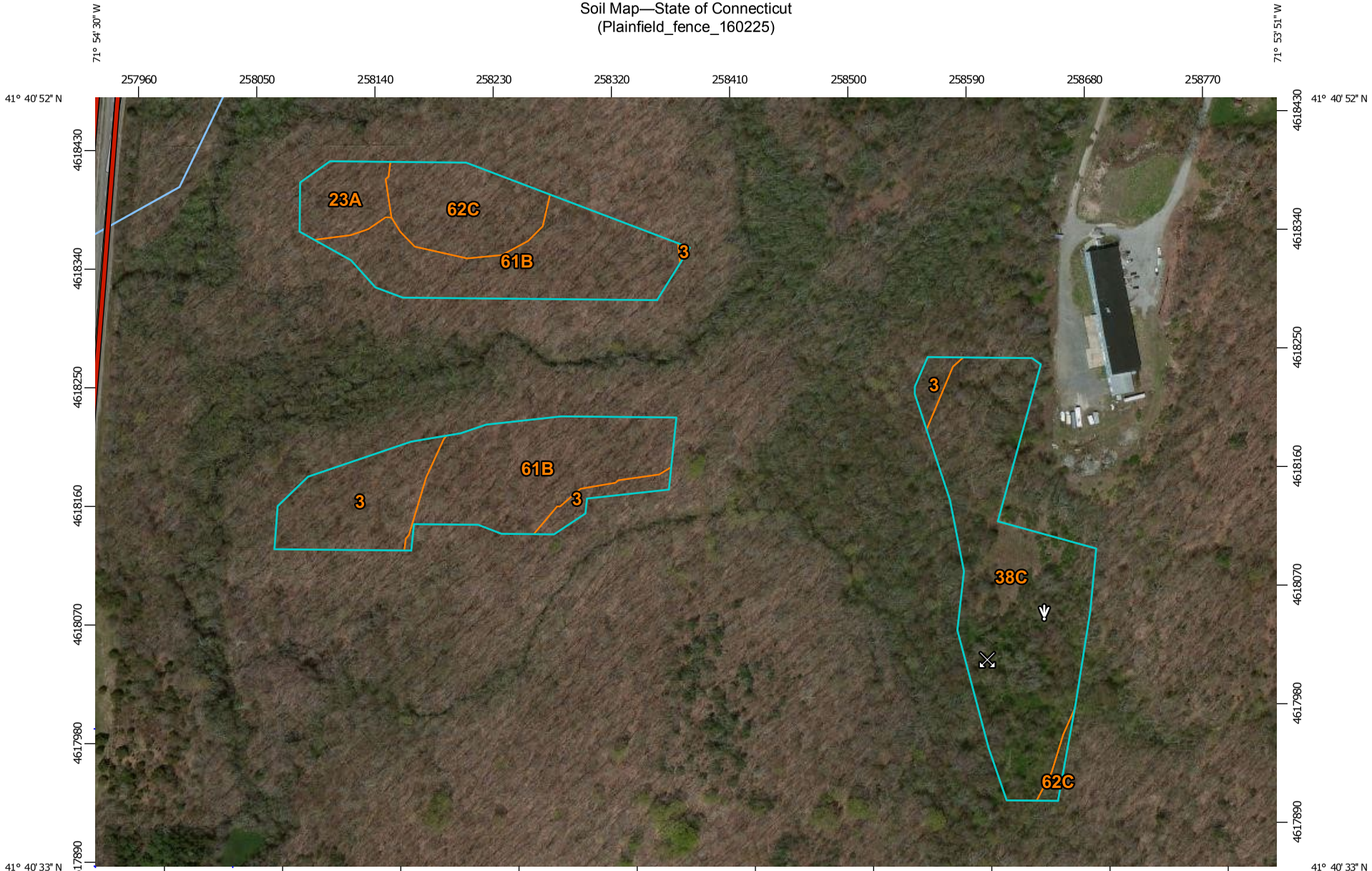
Drainage Map

Westwood

Toll Free (888) 937-5150 westwoodps.com

Westwood Professional Services, Inc.

Soil Map—State of Connecticut
(Plainfield_fence_160225)



Map Scale: 1:4,110 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 50 100 200 300

Feet
0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: State of Connecticut
Survey Area Data: Version 14, Sep 22, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 30, 2011—May 1, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

State of Connecticut (CT600)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
3	Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony	2.4	13.9%
23A	Sudbury sandy loam, 0 to 5 percent slopes	0.9	5.1%
38C	Hinckley loamy sand, 3 to 15 percent slopes	5.9	34.6%
61B	Canton and Charlton soils, 3 to 8 percent slopes, very stony	6.0	35.5%
62C	Canton and Charlton soils, 3 to 15 percent slopes, extremely stony	1.9	11.0%
Totals for Area of Interest		**16.9**	**100.0%**

NOAA Atlas 14, Volume 10, Version 2
Location name: Plainfield, Connecticut, US*
Latitude: 41.6813°, Longitude: -71.9050°
Elevation: 208 ft*
* source: Google Maps

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.329 (0.253-0.424)	0.395 (0.304-0.510)	0.504 (0.386-0.652)	0.593 (0.453-0.771)	0.717 (0.531-0.965)	0.812 (0.589-1.11)	0.908 (0.640-1.28)	1.02 (0.687-1.47)	1.18 (0.761-1.73)	1.29 (0.817-1.93)
10-min	0.466 (0.359-0.601)	0.560 (0.431-0.723)	0.713 (0.547-0.923)	0.841 (0.641-1.09)	1.02 (0.752-1.37)	1.15 (0.835-1.57)	1.29 (0.907-1.81)	1.45 (0.973-2.08)	1.67 (1.08-2.45)	1.83 (1.16-2.74)
15-min	0.548 (0.422-0.707)	0.659 (0.507-0.850)	0.839 (0.644-1.09)	0.989 (0.754-1.28)	1.20 (0.884-1.61)	1.35 (0.982-1.85)	1.51 (1.07-2.13)	1.71 (1.15-2.44)	1.96 (1.27-2.88)	2.15 (1.36-3.22)
30-min	0.757 (0.583-0.977)	0.911 (0.701-1.18)	1.16 (0.892-1.50)	1.37 (1.05-1.78)	1.66 (1.23-2.23)	1.88 (1.36-2.57)	2.10 (1.48-2.96)	2.37 (1.59-3.40)	2.73 (1.77-4.02)	3.00 (1.90-4.49)
60-min	0.966 (0.744-1.25)	1.16 (0.895-1.50)	1.49 (1.14-1.92)	1.75 (1.34-2.28)	2.12 (1.57-2.86)	2.40 (1.75-3.29)	2.69 (1.90-3.79)	3.04 (2.04-4.35)	3.50 (2.26-5.15)	3.84 (2.43-5.75)
2-hr	1.25 (0.967-1.60)	1.50 (1.16-1.93)	1.92 (1.48-2.47)	2.26 (1.74-2.93)	2.74 (2.04-3.67)	3.11 (2.27-4.24)	3.47 (2.47-4.89)	3.96 (2.67-5.63)	4.60 (2.98-6.73)	5.08 (3.23-7.55)
3-hr	1.45 (1.12-1.85)	1.74 (1.35-2.23)	2.22 (1.72-2.85)	2.62 (2.01-3.37)	3.17 (2.37-4.23)	3.59 (2.63-4.88)	4.01 (2.87-5.64)	4.58 (3.09-6.50)	5.34 (3.47-7.78)	5.91 (3.76-8.75)
6-hr	1.86 (1.45-2.36)	2.23 (1.74-2.83)	2.83 (2.20-3.61)	3.33 (2.58-4.27)	4.02 (3.02-5.35)	4.55 (3.36-6.16)	5.09 (3.65-7.11)	5.81 (3.94-8.19)	6.77 (4.42-9.80)	7.49 (4.78-11.0)
12-hr	2.35 (1.84-2.97)	2.81 (2.20-3.55)	3.56 (2.78-4.51)	4.18 (3.25-5.32)	5.04 (3.80-6.65)	5.70 (4.22-7.65)	6.36 (4.58-8.81)	7.23 (4.92-10.1)	8.39 (5.49-12.1)	9.26 (5.93-13.5)
24-hr	2.80 (2.21-3.52)	3.36 (2.65-4.22)	4.27 (3.36-5.39)	5.03 (3.94-6.37)	6.08 (4.61-7.97)	6.88 (5.12-9.18)	7.68 (5.56-10.6)	8.75 (5.97-12.2)	10.2 (6.67-14.5)	11.2 (7.20-16.3)
2-day	3.16 (2.51-3.95)	3.82 (3.03-4.78)	4.90 (3.88-6.14)	5.80 (4.56-7.30)	7.04 (5.37-9.19)	7.99 (5.98-10.6)	8.94 (6.51-12.3)	10.3 (7.03-14.2)	12.0 (7.91-17.0)	13.3 (8.57-19.2)
3-day	3.42 (2.73-4.26)	4.14 (3.30-5.16)	5.32 (4.22-6.64)	6.29 (4.96-7.89)	7.63 (5.84-9.94)	8.66 (6.50-11.5)	9.69 (7.09-13.3)	11.2 (7.66-15.4)	13.1 (8.64-18.5)	14.5 (9.38-20.9)
4-day	3.67 (2.93-4.55)	4.42 (3.53-5.50)	5.67 (4.50-7.06)	6.69 (5.29-8.38)	8.11 (6.22-10.5)	9.20 (6.93-12.2)	10.3 (7.55-14.1)	11.9 (8.15-16.3)	13.9 (9.21-19.6)	15.5 (10.0-22.2)
7-day	4.33 (3.48-5.36)	5.18 (4.16-6.41)	6.57 (5.25-8.15)	7.72 (6.13-9.61)	9.30 (7.17-12.0)	10.5 (7.95-13.9)	11.7 (8.64-16.0)	13.5 (9.31-18.4)	15.8 (10.5-22.2)	17.6 (11.4-25.0)
10-day	5.01 (4.03-6.17)	5.91 (4.75-7.29)	7.38 (5.91-9.12)	8.59 (6.84-10.7)	10.3 (7.93-13.2)	11.6 (8.75-15.1)	12.9 (9.46-17.4)	14.7 (10.1-19.9)	17.0 (11.3-23.8)	18.8 (12.2-26.7)
20-day	7.14 (5.78-8.75)	8.10 (6.55-9.93)	9.66 (7.79-11.9)	11.0 (8.78-13.5)	12.7 (9.86-16.2)	14.1 (10.7-18.2)	15.5 (11.3-20.5)	17.1 (11.9-23.1)	19.2 (12.8-26.6)	20.8 (13.5-29.2)
30-day	8.94 (7.26-10.9)	9.92 (8.05-12.1)	11.5 (9.32-14.1)	12.9 (10.3-15.8)	14.7 (11.4-18.5)	16.1 (12.2-20.6)	17.5 (12.8-22.9)	18.9 (13.2-25.4)	20.7 (13.9-28.6)	22.1 (14.4-31.0)
45-day	11.2 (9.11-13.6)	12.2 (9.93-14.8)	13.9 (11.2-16.9)	15.2 (12.3-18.7)	17.1 (13.3-21.5)	18.6 (14.1-23.6)	20.1 (14.6-26.0)	21.3 (14.9-28.4)	22.8 (15.3-31.3)	24.0 (15.7-33.5)
60-day	13.0 (10.6-15.8)	14.1 (11.5-17.1)	15.8 (12.9-19.3)	17.3 (13.9-21.1)	19.2 (15.0-24.0)	20.8 (15.7-26.2)	22.3 (16.2-28.7)	23.4 (16.4-31.2)	24.8 (16.7-34.0)	25.9 (16.9-36.1)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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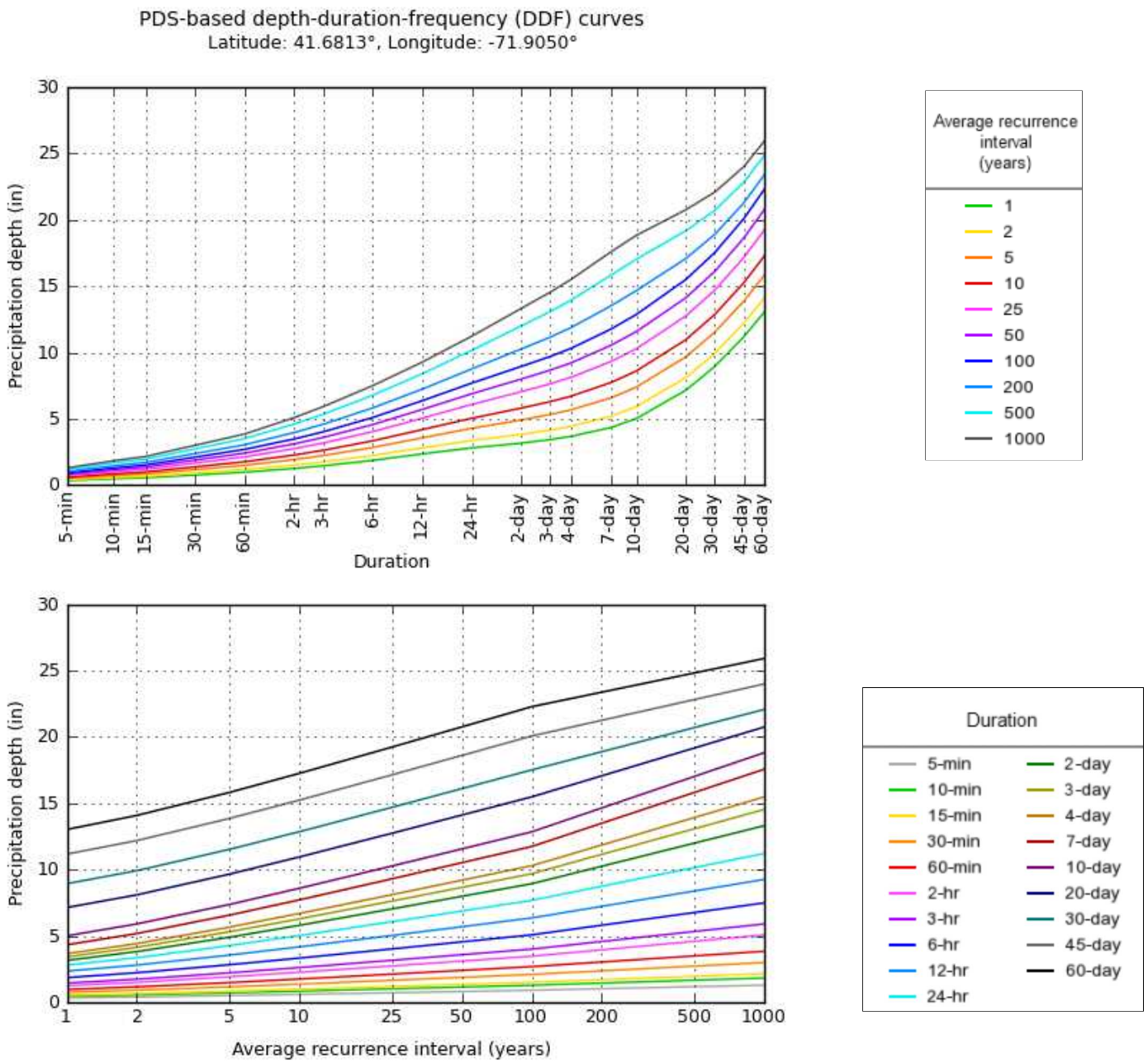
PF graphical



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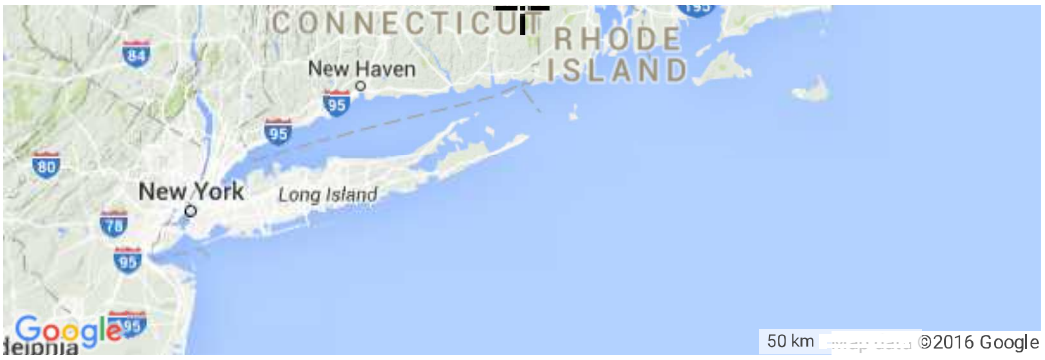
Maps & aerials

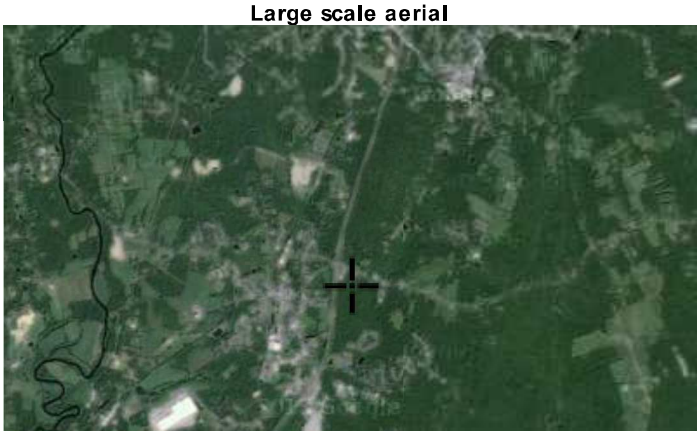
Small scale terrain



Large scale terrain

Large scale map

Large scale aerial



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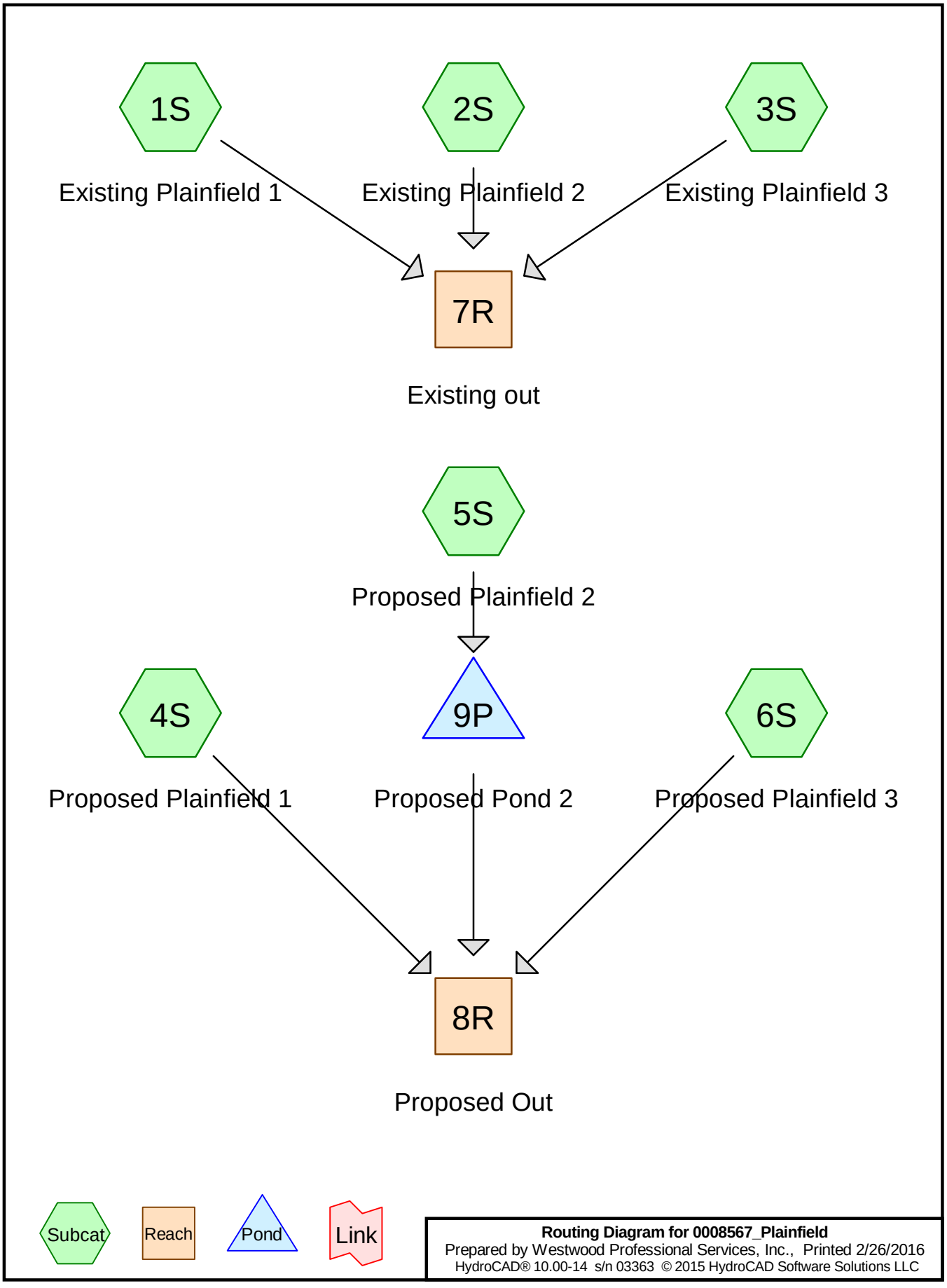
1S
2S
3S
Existing Plainfield 1
Existing Plainfield 2
Existing Plainfield 3
7R
Existing out
5S
Proposed Plainfield 2
4S
9P
6S
Proposed Plainfield 1
Proposed Pond 2
Proposed Plainfield 3
8R
Proposed Out
Subcat
Reach
Pond
Link
Routing Diagram for 0008567_Plainfield
Prepared by Westwood Professional Services, Inc., Printed 2/26/2016
HydroCAD® 10.00-14 s/n 03363 © 2015 HydroCAD Software Solutions LLC

Summary for Subcatchment 1S: Existing Plainfield 1

Runoff = 0.43 cfs @ 12.48 hrs, Volume= 0.140 af, Depth= 0.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
CT-Plainfield 24-hr S1 2-yr Rainfall=3.36"

	Area (ac)	CN	Description
*	5.608	55	Weighted CN
	5.608		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.4	550	0.0327	0.43		**Lag/CN Method,**

Summary for Subcatchment 2S: Existing Plainfield 2

Runoff = 2.05 cfs @ 12.20 hrs, Volume= 0.271 af, Depth= 0.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
CT-Plainfield 24-hr S1 2-yr Rainfall=3.36"

	Area (ac)	CN	Description
*	5.123	64	Weighted CN
	5.123		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.5	615	0.0471	0.66		**Lag/CN Method,**

Summary for Subcatchment 3S: Existing Plainfield 3

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
CT-Plainfield 24-hr S1 2-yr Rainfall=3.36"

	Area (ac)	CN	Description
*	6.196	34	Weighted CN
	6.196		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.3	570	0.0368	0.26		**Lag/CN Method,**

Summary for Subcatchment 4S: Proposed Plainfield 1

Runoff = 1.18 cfs @ 12.28 hrs, Volume= 0.221 af, Depth= 0.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
CT-Plainfield 24-hr S1 2-yr Rainfall=3.36"

	Area (ac)	CN	Description
	5.258	58	Meadow, non-grazed, HSG B
*	0.011	98	Electrical components
*	0.339	98	Access Roads internal and external
	5.608	60	Weighted Average
	5.258		93.76% Pervious Area
	0.350		6.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.9	550	0.0327	0.49		**Lag/CN Method,**

Summary for Subcatchment 5S: Proposed Plainfield 2

Runoff = 4.55 cfs @ 12.13 hrs, Volume= 0.440 af, Depth= 1.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
CT-Plainfield 24-hr S1 2-yr Rainfall=3.36"

	Area (ac)	CN	Description
	4.868	71	Meadow, non-grazed, HSG C
*	0.011	98	Electrical compenents
*	0.244	98	Access Roads internal and external
	5.123	72	Weighted Average
	4.868		95.02% Pervious Area
	0.255		4.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	615	0.0471	0.82		**Lag/CN Method,**

Summary for Subcatchment 6S: Proposed Plainfield 3

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
CT-Plainfield 24-hr S1 2-yr Rainfall=3.36"

	Area (ac)	CN	Description
	6.196	30	Meadow, non-grazed, HSG A
*	0.110	98	Electrical Components
*	0.427	98	Access Roads internal and external
	6.733	35	Weighted Average
	6.196		92.02% Pervious Area
	0.537		7.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.2	570	0.0368	0.27		**Lag/CN Method,**

Summary for Reach 7R: Existing out

Inflow Area = 16.927 ac, 0.00% Impervious, Inflow Depth = 0.29" for 2-yr event
Inflow = 2.24 cfs @ 12.22 hrs, Volume= 0.411 af
Outflow = 2.24 cfs @ 12.22 hrs, Volume= 0.411 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Reach 8R: Proposed Out

Inflow Area = 17.464 ac, 6.54% Impervious, Inflow Depth > 0.45" for 2-yr event
Inflow = 1.82 cfs @ 12.30 hrs, Volume= 0.658 af
Outflow = 1.82 cfs @ 12.30 hrs, Volume= 0.658 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Pond 9P: Proposed Pond 2

Inflow Area = 5.123 ac, 4.98% Impervious, Inflow Depth = 1.03" for 2-yr event
Inflow = 4.55 cfs @ 12.13 hrs, Volume= 0.440 af
Outflow = 0.76 cfs @ 12.94 hrs, Volume= 0.437 af, Atten= 83%, Lag= 48.2 min
Primary = 0.76 cfs @ 12.94 hrs, Volume= 0.437 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 186.28' @ 12.94 hrs Surf.Area= 5,438 sf Storage= 6,124 cf

Plug-Flow detention time= 118.8 min calculated for 0.437 af (99% of inflow)
Center-of-Mass det. time= 114.9 min (1,018.8 - 903.9)

Volume	Invert	Avail.Storage	Storage Description
#1	185.00'	34,093 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
185.00	4,172	0	0
186.00	5,149	4,661	4,661
187.00	6,195	5,672	10,333
188.00	7,308	6,752	17,084
189.00	8,488	7,898	24,982
190.00	9,734	9,111	34,093

Device	Routing	Invert	Outlet Devices
#1	Primary	189.00'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Primary	185.00'	**6.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 185.00' / 184.00' S= 0.0333 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=0.76 cfs @ 12.94 hrs HW=186.28' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
└─**2=Culvert** (Inlet Controls 0.76 cfs @ 3.85 fps)

Summary for Subcatchment 1S: Existing Plainfield 1

Runoff = 3.08 cfs @ 12.29 hrs, Volume= 0.467 af, Depth= 1.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
CT-Plainfield 24-hr S1 10-yr Rainfall=5.04"

	Area (ac)	CN	Description
*	5.608	55	Weighted CN
	5.608		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.4	550	0.0327	0.43		**Lag/CN Method,**

Summary for Subcatchment 2S: Existing Plainfield 2

Runoff = 6.41 cfs @ 12.18 hrs, Volume= 0.686 af, Depth= 1.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
CT-Plainfield 24-hr S1 10-yr Rainfall=5.04"

	Area (ac)	CN	Description
*	5.123	64	Weighted CN
	5.123		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.5	615	0.0471	0.66		**Lag/CN Method,**

Summary for Subcatchment 3S: Existing Plainfield 3

Runoff = 0.05 cfs @ 23.99 hrs, Volume= 0.034 af, Depth= 0.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
CT-Plainfield 24-hr S1 10-yr Rainfall=5.04"

	Area (ac)	CN	Description
*	6.196	34	Weighted CN
	6.196		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.3	570	0.0368	0.26		**Lag/CN Method,**

Summary for Subcatchment 4S: Proposed Plainfield 1

Runoff = 4.96 cfs @ 12.23 hrs, Volume= 0.619 af, Depth= 1.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
CT-Plainfield 24-hr S1 10-yr Rainfall=5.04"

	Area (ac)	CN	Description
	5.258	58	Meadow, non-grazed, HSG B
*	0.011	98	Electrical components
*	0.339	98	Access Roads internal and external
	5.608	60	Weighted Average
	5.258		93.76% Pervious Area
	0.350		6.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.9	550	0.0327	0.49		**Lag/CN Method,**

Summary for Subcatchment 5S: Proposed Plainfield 2

Runoff = 10.47 cfs @ 12.13 hrs, Volume= 0.951 af, Depth= 2.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
CT-Plainfield 24-hr S1 10-yr Rainfall=5.04"

	Area (ac)	CN	Description
	4.868	71	Meadow, non-grazed, HSG C
*	0.011	98	Electrical compenents
*	0.244	98	Access Roads internal and external
	5.123	72	Weighted Average
	4.868		95.02% Pervious Area
	0.255		4.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	615	0.0471	0.82		**Lag/CN Method,**

Summary for Subcatchment 6S: Proposed Plainfield 3

Runoff = 0.06 cfs @ 20.85 hrs, Volume= 0.050 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
CT-Plainfield 24-hr S1 10-yr Rainfall=5.04"

	Area (ac)	CN	Description
	6.196	30	Meadow, non-grazed, HSG A
*	0.110	98	Electrical Components
*	0.427	98	Access Roads internal and external
	6.733	35	Weighted Average
	6.196		92.02% Pervious Area
	0.537		7.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.2	570	0.0368	0.27		**Lag/CN Method,**

Summary for Reach 7R: Existing out

Inflow Area = 16.927 ac, 0.00% Impervious, Inflow Depth = 0.84" for 10-yr event
Inflow = 9.05 cfs @ 12.21 hrs, Volume= 1.187 af
Outflow = 9.05 cfs @ 12.21 hrs, Volume= 1.187 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Reach 8R: Proposed Out

Inflow Area = 17.464 ac, 6.54% Impervious, Inflow Depth > 1.11" for 10-yr event
Inflow = 5.97 cfs @ 12.24 hrs, Volume= 1.616 af
Outflow = 5.97 cfs @ 12.24 hrs, Volume= 1.616 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Pond 9P: Proposed Pond 2

Inflow Area = 5.123 ac, 4.98% Impervious, Inflow Depth = 2.23" for 10-yr event
Inflow = 10.47 cfs @ 12.13 hrs, Volume= 0.951 af
Outflow = 1.21 cfs @ 13.25 hrs, Volume= 0.948 af, Atten= 88%, Lag= 67.2 min
Primary = 1.21 cfs @ 13.25 hrs, Volume= 0.948 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 187.89' @ 13.25 hrs Surf.Area= 7,185 sf Storage= 16,285 cf

Plug-Flow detention time= 168.1 min calculated for 0.948 af (100% of inflow)
Center-of-Mass det. time= 165.9 min (1,040.0 - 874.0)

Volume	Invert	Avail.Storage	Storage Description
#1	185.00'	34,093 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
185.00	4,172	0	0
186.00	5,149	4,661	4,661
187.00	6,195	5,672	10,333
188.00	7,308	6,752	17,084
189.00	8,488	7,898	24,982
190.00	9,734	9,111	34,093

Device	Routing	Invert	Outlet Devices
#1	Primary	189.00'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Primary	185.00'	**6.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 185.00' / 184.00' S= 0.0333 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=1.21 cfs @ 13.25 hrs HW=187.89' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
└**2=Culvert** (Inlet Controls 1.21 cfs @ 6.18 fps)

Summary for Subcatchment 1S: Existing Plainfield 1

Runoff = 9.80 cfs @ 12.26 hrs, Volume= 1.203 af, Depth= 2.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
CT-Plainfield 24-hr S1 100-yr Rainfall=7.69"

	Area (ac)	CN	Description
*	5.608	55	Weighted CN
	5.608		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.4	550	0.0327	0.43		**Lag/CN Method,**

Summary for Subcatchment 2S: Existing Plainfield 2

Runoff = 15.30 cfs @ 12.17 hrs, Volume= 1.509 af, Depth= 3.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
CT-Plainfield 24-hr S1 100-yr Rainfall=7.69"

	Area (ac)	CN	Description
*	5.123	64	Weighted CN
	5.123		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.5	615	0.0471	0.66		**Lag/CN Method,**

Summary for Subcatchment 3S: Existing Plainfield 3

Runoff = 0.80 cfs @ 12.79 hrs, Volume= 0.322 af, Depth= 0.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
CT-Plainfield 24-hr S1 100-yr Rainfall=7.69"

	Area (ac)	CN	Description
*	6.196	34	Weighted CN
	6.196		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.3	570	0.0368	0.26		**Lag/CN Method,**

Summary for Subcatchment 4S: Proposed Plainfield 1

Runoff = 13.09 cfs @ 12.22 hrs, Volume= 1.450 af, Depth= 3.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
CT-Plainfield 24-hr S1 100-yr Rainfall=7.69"

	Area (ac)	CN	Description
	5.258	58	Meadow, non-grazed, HSG B
*	0.011	98	Electrical components
*	0.339	98	Access Roads internal and external
	5.608	60	Weighted Average
	5.258		93.76% Pervious Area
	0.350		6.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.9	550	0.0327	0.49		**Lag/CN Method,**

Summary for Subcatchment 5S: Proposed Plainfield 2

Runoff = 21.62 cfs @ 12.12 hrs, Volume= 1.888 af, Depth= 4.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
CT-Plainfield 24-hr S1 100-yr Rainfall=7.69"

	Area (ac)	CN	Description
	4.868	71	Meadow, non-grazed, HSG C
*	0.011	98	Electrical compenents
*	0.244	98	Access Roads internal and external
	5.123	72	Weighted Average
	4.868		95.02% Pervious Area
	0.255		4.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	615	0.0471	0.82		**Lag/CN Method,**

Summary for Subcatchment 6S: Proposed Plainfield 3

Runoff = 1.10 cfs @ 12.72 hrs, Volume= 0.393 af, Depth= 0.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
CT-Plainfield 24-hr S1 100-yr Rainfall=7.69"

	Area (ac)	CN	Description
	6.196	30	Meadow, non-grazed, HSG A
*	0.110	98	Electrical Components
*	0.427	98	Access Roads internal and external
	6.733	35	Weighted Average
	6.196		92.02% Pervious Area
	0.537		7.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.2	570	0.0368	0.27		**Lag/CN Method,**

Summary for Reach 7R: Existing out

Inflow Area = 16.927 ac, 0.00% Impervious, Inflow Depth = 2.15" for 100-yr event
Inflow = 24.13 cfs @ 12.20 hrs, Volume= 3.035 af
Outflow = 24.13 cfs @ 12.20 hrs, Volume= 3.035 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Reach 8R: Proposed Out

Inflow Area = 17.464 ac, 6.54% Impervious, Inflow Depth > 2.56" for 100-yr event
Inflow = 17.28 cfs @ 12.36 hrs, Volume= 3.727 af
Outflow = 17.28 cfs @ 12.36 hrs, Volume= 3.727 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Pond 9P: Proposed Pond 2

Inflow Area = 5.123 ac, 4.98% Impervious, Inflow Depth = 4.42" for 100-yr event
Inflow = 21.62 cfs @ 12.12 hrs, Volume= 1.888 af
Outflow = 7.57 cfs @ 12.43 hrs, Volume= 1.884 af, Atten= 65%, Lag= 18.5 min
Primary = 7.57 cfs @ 12.43 hrs, Volume= 1.884 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 189.39' @ 12.43 hrs Surf.Area= 8,973 sf Storage= 28,379 cf

Plug-Flow detention time= 185.3 min calculated for 1.881 af (100% of inflow)
Center-of-Mass det. time= 184.4 min (1,032.5 - 848.1)

Volume	Invert	Avail.Storage	Storage Description
#1	185.00'	34,093 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
185.00	4,172	0	0
186.00	5,149	4,661	4,661
187.00	6,195	5,672	10,333
188.00	7,308	6,752	17,084
189.00	8,488	7,898	24,982
190.00	9,734	9,111	34,093

Device	Routing	Invert	Outlet Devices
#1	Primary	189.00'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Primary	185.00'	**6.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 185.00' / 184.00' S= 0.0333 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=7.52 cfs @ 12.43 hrs HW=189.39' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 6.00 cfs @ 1.55 fps)
└**2=Culvert** (Inlet Controls 1.52 cfs @ 7.73 fps)

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Plainfield Pike Solar Project - Decommissioning Memo

This memo describes a Decommissioning Plan that establishes the approach to conduct decommissioning activities for the permanent closure of the Facilities at the end of the Facilities' useful life or the permanent cessation of the Facilities' operation, whichever comes first. The Plan describes the approach for removal and/or abandonment of facilities and equipment associated with the Facilities and describes anticipated land-restoration activities.

DECOMMISSIONING ACTIVITIES

Decommissioning will involve removal and disposal or recycling of all above-surface Project components. All recyclable materials will be transported to the appropriate nearby recycling facilities. Any non-recyclable materials will be properly disposed of at a nearby landfill. 95% or greater of the Facilities' components will be recyclable.

Decommissioning Preparation

The first step in the decommissioning process will be to assess existing site conditions and prepare the site for demolition. Site decommissioning and equipment removal can take up to six months to complete for a project of this size. Therefore, access roads, fencing, and electrical power will temporarily remain in place for use by the decommissioning and site restoration workers until no longer needed. Demolition debris will be placed in temporary on-site storage areas pending final transportation and disposal/recycling according to the procedures listed below.

PV Equipment Removal and Recycling

During decommissioning, all Facilities components will be either removed from the site and recycled or abandoned in place 12 inches below grade (for underground conduit and conductors). Equipment removal will include all pad-mounted cabinets, above ground wiring, solar modules, solar module racking, string inverters, and panel boards. Steel h-beams that supported the module racking and inverters/panelboards will be mechanically pulled out of the ground; any resulting holes will be backfilled with locally imported soil to match existing site soil conditions. The concrete transformer and interconnection equipment pads will be broken up and removed.

The demolition debris and removed equipment may be cut or dismantled into pieces that can be safely lifted or carried with the on-site equipment being used. The majority of glass and steel and aluminum will be processed for transportation and delivery to an off-site recycling center. The solar modules will be transported to and recycled at the nearest facility that will accept them. Minimal non-recyclable materials are anticipated; these will be properly disposed of at the nearest qualified disposal facility.

Internal Power Collection System

The DC and AC power collection system will be dismantled and removed. All underground cables and conduit will remain in place at a depth of 12 inches below ground surface. All conduit and cabling that is removed will be recycled.

Access Roads

The onsite 20-foot wide access driveway will remain in place to accomplish decommissioning at the end of the facility's life. At the time of decommissioning, if the landowner determines that this road will be beneficial for the future use of the site, the access road may remain after decommissioning. The future use of the site is undetermined at this time. Roads that will not be used will be restored to pre-construction conditions by removal of the aggregate base material, fill of the compacted base section with locally imported soil to match existing onsite soils, and a hydroseeding of a seed mix to match existing onsite groundcover.

Security Fence

The 7.5 foot high chain link perimeter security fence will remain in place during decommissioning activities for site safety and security purposes. At the time of decommissioning, if the landowner determines that this fence will be beneficial for the future use of the site, the fence may remain after decommissioning. The future use of the site is undetermined at this time. If the fencing is not used, it will be removed and transported to the nearest steel recycling facility. Holes left behind by the fence support posts will be backfilled with locally imported soil to match existing onsite soils, and a hydroseeding of a seed mix to match existing onsite groundcover.

Landscaping

The double row of screening vegetation along certain areas of the northern and western perimeter of the Site will remain in place during decommissioning activities for site safety and security purposes. At the time of decommissioning, if the landowner determines that this landscaping will be beneficial for the future use of the site, the landscaping may remain after decommissioning. The future use of the site is undetermined at this time. If the landscaping is not used, it will be removed and transported to the nearest plant material disposal facility for composting or mulching. Shrubs, bushes, and trees would be stump cut to just below ground level.

23 kV Interconnection Line

The overhead interconnection cabling that runs north from the project and across Williams Crossing Road to connect the Facilities to the CL&P distribution circuit will remain in place during decommissioning activities to provide electric service onsite during decommissioning. At the time of decommissioning, if the landowner determines that this electric service line will be beneficial for the future use of the site, the line may remain after

decommissioning. If the line is not used, it will be removed per CL&P guidelines and transported offsite to the nearest recycling facility. Underground cabling and conduit on private property will remain in place at a depth of 12 inches below ground level. Underground cabling and conduit within a public right-of-way will be removed completely, and the resulting trenches will be backfilled with locally imported soil to match existing onsite soils, and a hydroseeding of a seed mix to match existing onsite groundcover.

SITE RECLAMATION

After the Facilities are completely decommissioned, and all Facilities equipment has been removed from the Site, additional activities will be performed to return the resultantly vacant property back to pre-construction conditions.

Restoration Process

The decommissioning process will remove Project-related structures and infrastructure as described in the previous sections. Following decommissioning, site reclamation activities will occur. Reclamation will restore landform features, vegetative cover, and hydrologic function after the closure of the facility. The process will involve (where needed) the replacement of topsoil and vegetation, as well as modification of site topography where necessary to bring the Site back to pre-construction conditions. Restoration will bring the Site back to a natural pre-construction condition that is compatible with the adjacent surroundings.

If any excavated areas remain after removal of equipment pads or access road base material, these areas will be backfilled and compacted with locally imported soil to match existing onsite soils, and a hydroseeding of a seed mix to match existing onsite groundcover. Any other areas of lower than average ground surface level will receive the same treatment.

If any soils are determined to be compacted at levels that would affect successful revegetation, decompaction will occur. The method of decompaction will depend on how compacted the soil has become over the life of the Project. Following decompaction, re-contouring of the site will be conducted, if necessary, to return the Site to approximately match the pre-construction surface conditions and the surrounding area conditions. Original site drainage characteristics will be restored if they have not been maintained. It is unlikely that any or a significant amount of earthwork will be required, as the Project construction plan calls for minimal or no disturbance of the Site during Project construction. Grading activities will be limited to previously disturbed areas that require re-contouring. Efforts will be made to disturb as little of the natural drainages and existing natural vegetation that remain post-decommissioning as possible.

Any areas identified as remaining in bare earth will be hydroseeded with a seed mix to match existing onsite groundcover.

Site Restoration activities are anticipated to be very minimal, as the pre-construction conditions of the site are not planned to be significantly altered during Project construction. However, these activities as described, as well as any others that become necessary, will be performed to return the Site to a pre-construction condition.

Monitoring Activities

The Site will be monitored after Site Restoration activities are complete to confirm that any earthwork and revegetation were performed correctly and last permanently. The Site will be periodically inspected (at least twice annually) to check for any eroded earthwork or failed revegetation. Any deficiencies will be immediately corrected. This monitoring will continue for a period of five years, or until the Site is re-developed for another future purpose, whichever comes first.