ENVIRONMENTAL ASSESSMENT

PROPOSED BUNCE 1

SOLAR PROJECT

EAST MAIN STREET

NORTH CANAAN, CONNECTICUT

LITCHFIELD COUNTY

Prepared for:

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October 2021

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Figure No. **Title**

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Attachments

1 Introduction

All-Points Technology Corporation, P.C. ("APT") prepared this Environmental Assessment ("EA") on behalf of LSE Indus LLC (hereinafter referred to as the "Petitioner") for the proposed installation of a solar-based electric generating facility, with output of approximately 1.99 megawatts[1] ("MW") (collectively, the "Project") located in the Town of North Canaan, Connecticut ("Town"). This EA has been completed to support the Petitioner's submission to the Connecticut Siting Council ("Council") for a declaratory ruling that no Certificate of Environmental Compatibility and Public Need is required for the construction, maintenance, and operation of the electric generating facility.

The results of this assessment demonstrate that the proposed development will comply with the Connecticut Department of Energy and Environmental Protection's ("DEEP") air and water quality standards and will not have an undue adverse effect on the existing environment and ecology. Further, a review of Connecticut General Statutes § 22a-20a indicates that the proposed Project is neither defined as an "affecting facility"[2] nor located within an "environmental justice community."[3]

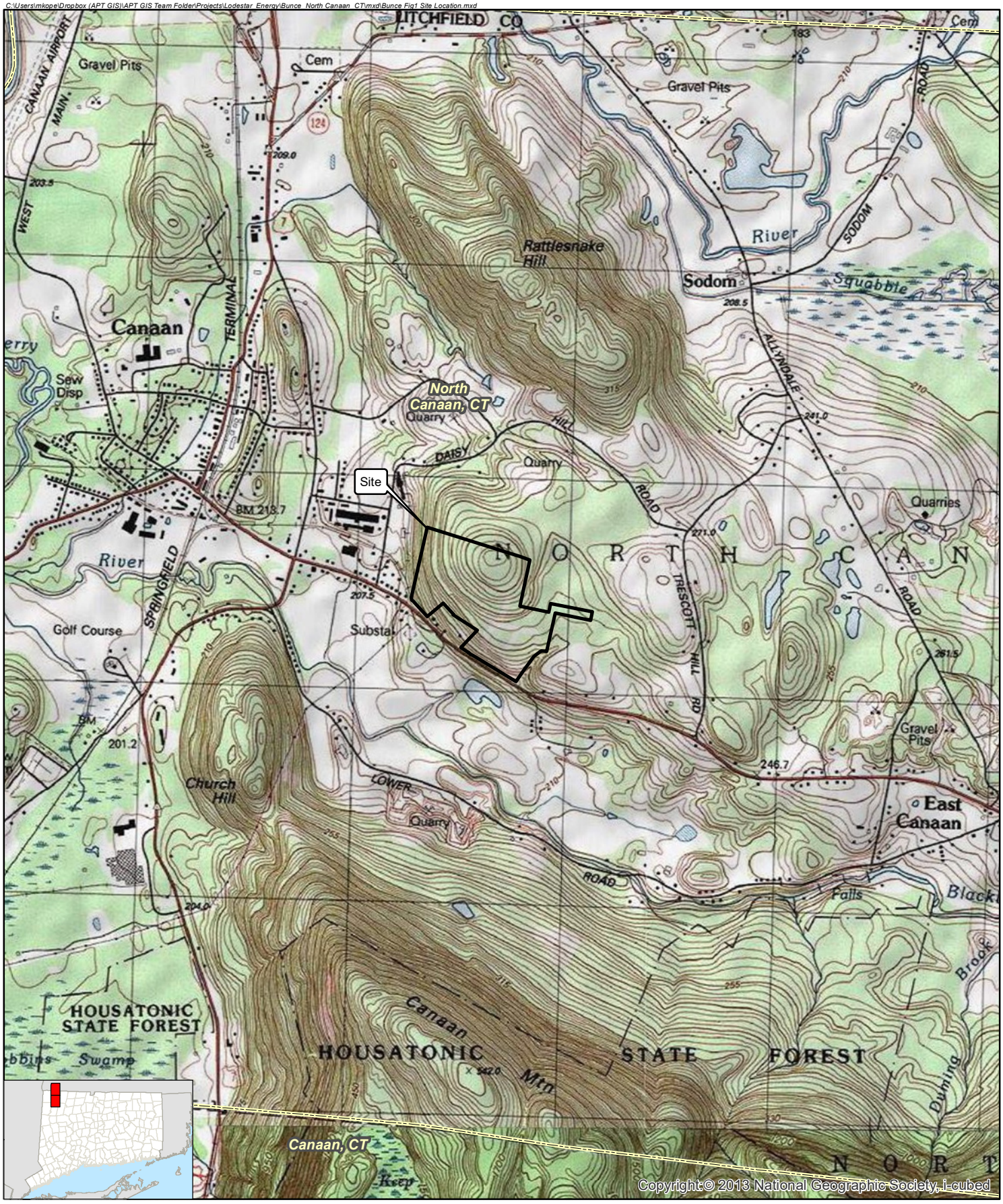
The Project will be located at 81 East Main Street (U.S. Highway 44) in North Canaan on two parcels in common ownership totaling approximately 67 acres ("Site"). The Site is privately owned and residentially developed. The Site's northern portion is a mix of wooded and cleared areas, and occupied by the residence and an outbuilding. The central portion of the Site is cleared and used as a hay field and private airplane landing strip. The southern portion of the Site is wooded.

Figure 1, *Site Location Map*, depicts the location of the Site and the immediate surrounding area.

[1] The output referenced is Alternating Current (AC).

[2] "Affecting facility" is defined, in part, as any electric generating facility with a capacity of more than ten megawatts.

[3] "Environmental justice community" means (A) a United States census block group, as determined in accordance with the most recent United States census, for which thirty per cent or more of the population consists of low income persons who are not institutionalized and have an income below two hundred per cent of the federal poverty level, or (B) a distressed municipality, as defined in subsection (b) of § 32-9p.



Legend

- Site
- Municipal Boundary

Figure 1
Site Location Map

Proposed Solar Facility
81 East Main Street
North Canaan, Connecticut

Map Notes:
Base Map Source: USGS 7.5 Minute Topographic Quadrangle Maps, Ashley Falls, CT (1967) and South Canaan, CT (1969)
Map Scale: 1 inch = 2,000 feet
Map Date: June 2021

N

2,000 1,000 0 2,000 Feet

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2 Proposed Project

2.1 Project Setting

The Site is located north of East Main Street (aka Route 44) approximately 0.75-mile east of the town center of North Canaan. The surrounding land use is primarily residential, with commercial/industrial development and undeveloped wooded land immediately to the west and north, respectively. Residences and agricultural fields are located to the south and east.

The Project will be located in the eastern portion of the Site, north and south of the air strip (the "Project Area").

The Site's existing topography varies, ranging from approximately 920 feet above mean sea level ("AMSL") to 720 feet AMSL. In general, the Project Area slopes downward from north to south.

Figure 2, *Existing Conditions Map*, depicts current conditions on the Site.

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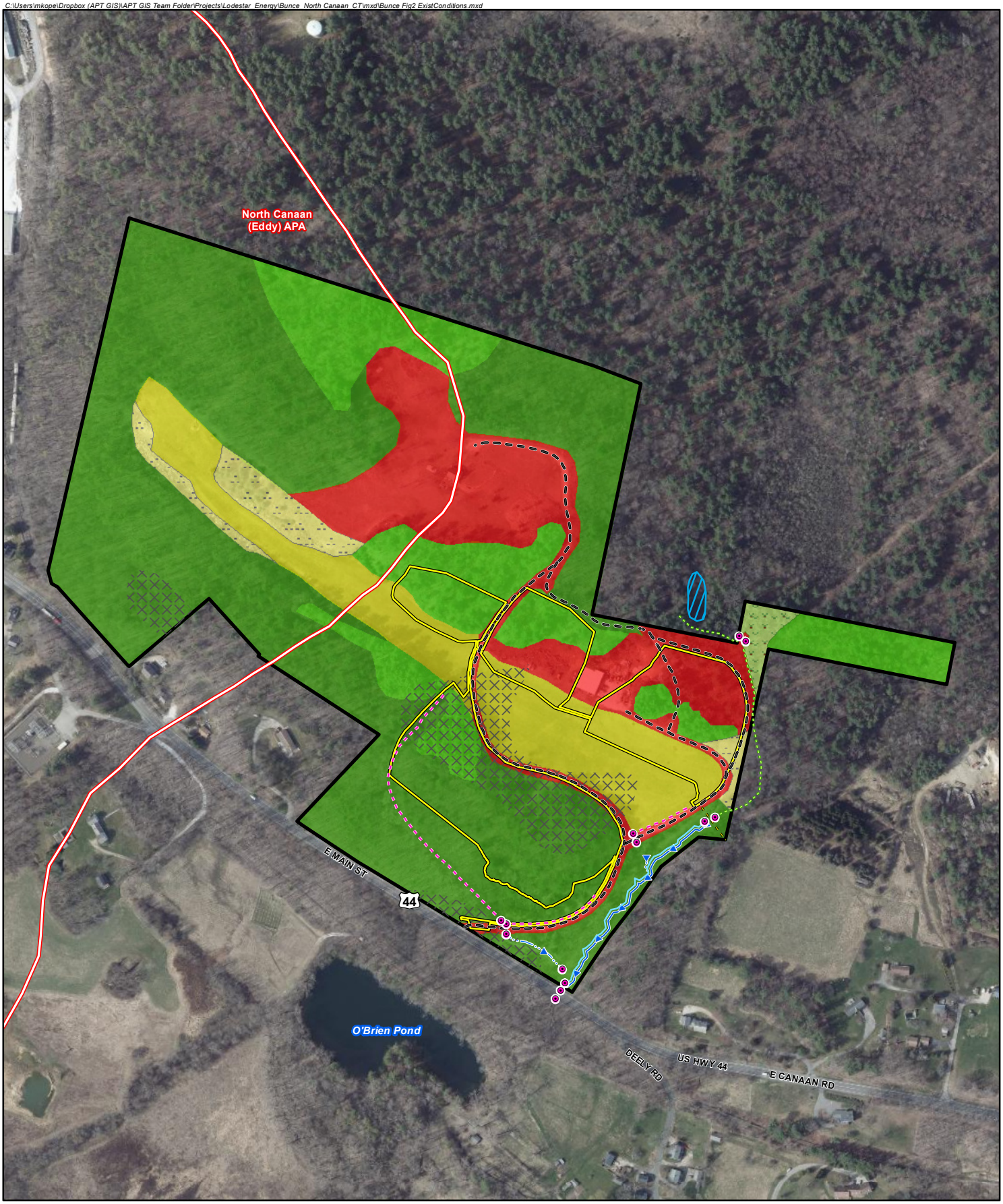

Legend

- Site
- Project Area
- Existing Dirt Driveway
- Existing Woods Road
- Existing Drainage Ditch
- Approximate Wetland Boundary
- Delineated Bank Boundary (OHWM)
- Aquifer Protection Area (Nov 2020)

Habitat Cover Type

- Developed
- Field - Forest Edge Habitat
- Hayfield

Forest

- Forested Wetland
- Mixed Hardwood-White Pine Forest
- White Pine-Mixed Hardwood Forest

- Existing Culvert
- Prime Farmland Soils
- Vernal Pool
- Perennial Stream
- Delineated Intermittent Watercourse

N

400 200 0 400 Feet

Map Notes:
Base Map Source: 2019 Aerial Photograph (CTECO)
Map Scale: 1 inch = 400 feet
Map Date: October 2021

Figure 2
Existing Conditions Map

Proposed Solar Facility
81 East Main Street
North Canaan, Connecticut

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2.2 Project Development and Operation

Upon its completion, the solar electric energy generating facility (the "Facility") will consist of a total of 5,902 425W photovoltaic modules ("panels") divided among four (4) sections, 16 inverters, one pad mounted switchgear, and one (1) 1,000 kVA transformer and will have one (1) service interconnection line. A ground-mounted racking system will be used to secure the panel arrays. The perimeter of each section of the solar field will be surrounded by a seven (7)-foot tall chain link fence. The proposed electrical interconnection to the existing Eversource distribution system will extend underground to the western end of the southernmost section from East Main Street. Once complete, the Facility will occupy approximately 7.6 acres of the Site with an additional ±4.0 acres of improvements beyond the fenced limits, for a total of ±11.6 acres ("Project Area").

Proposed development drawings are provided in Attachment A, *Project Plans*.

The leading edge of the panels will be approximately thirty-six (36) inches above the existing ground surface, which will provide adequate room for any accumulating snow to "sheet" off. Any production degradation due to snow build-up has already been modeled into the annual system output and performance calculations. The Petitioner does not envision requiring any "snow removal" operations; rather, the snow will be allowed to melt or slide off.

Construction activities within the Project Area will include tree clearing; installing erosion and sedimentation ("E&S") control measures; creating water quality volume basins, diversion berms, plunge pools and temporary sediment traps; installing racking and modules; and electrical trenching. Earthwork is required to create an access drive; regrade (cuts/fills) within the Project Area for Project development and construction of the water quality volume features. These activities will allow the Project to comply with DEEP's *Appendix I, Stormwater Management at Solar Array Construction Projects*. ("Appendix I").

The Facility is unstaffed; after construction is complete and the Facility is operable, traffic at the Site will be minimal. It is anticipated that the Facility will require mowing and routine maintenance of the electrical equipment one (1) time per year. Annual maintenance will typically involve two (2) technicians for a day. Repairs will be made on an as-needed basis.

2.2.1 Access

The Facility will be accessed from East Main Street via a 15-foot-wide gravel drive that will utilize existing dirt driveways through the property. Access will extend around the eastern and northern sides of the southern section, with two sections extending north between the two northwestern sections and to the east of the northeastern section. New drives will extend to the southern and northeastern sections from the existing drive.

2.2.2 Public Health and Safety

The Project will meet or exceed applicable local, state, national and industry health and safety standards and requirements related to electric power generation. The Facility will not consume any raw materials, will not produce any by-products and will be unstaffed during normal operating conditions. The system will be remotely monitored and will have the ability to remotely de-energize in the case of an emergency.

The Facility will be enclosed by a seven (7)-foot tall chain link fence. The entrances to the Facility will be gated, limiting access to authorized personnel only. All Town emergency response personnel will be provided access via a Knox padlock. The Facility will be remotely monitored and will have the ability to remotely de-energize in the case of an emergency.

2.2.3 Land Use Plans

The Project is consistent with local, State, and Federal land use plans, including the Northwest Connecticut Council of Government's ("NCCOG's") 2008 Regional Plan of Conservation and Development, which outlines the need to protect the rural nature and pristine views of the region. This Project will allow the region to benefit from the renewable energy it produces while keeping in sync with the recommendations of the NCCOG's Regional Plan. The Project also supports the State's energy policy by developing a renewable energy resource while not having a substantial adverse environmental effect.

Although local land use requirements do not apply to this Project, it has been designed to meet the intent of the Town's land use regulations, to the extent feasible.

The Town's 2006 Plan of Conservation and Development does not address renewable energy or electric utility planning.

3 Environmental Conditions

This section provides an overview of the current environmental conditions at the Site and an evaluation of the Project's potential impacts on the environment. The results of this assessment demonstrate that the Project will comply with the DEEP air and water quality standards and will not have an undue adverse effect on the existing environment and ecology.

Please refer to Figure 3, Proposed Conditions Map for a depiction of the Project and its compatibility with the resources discussed herein.

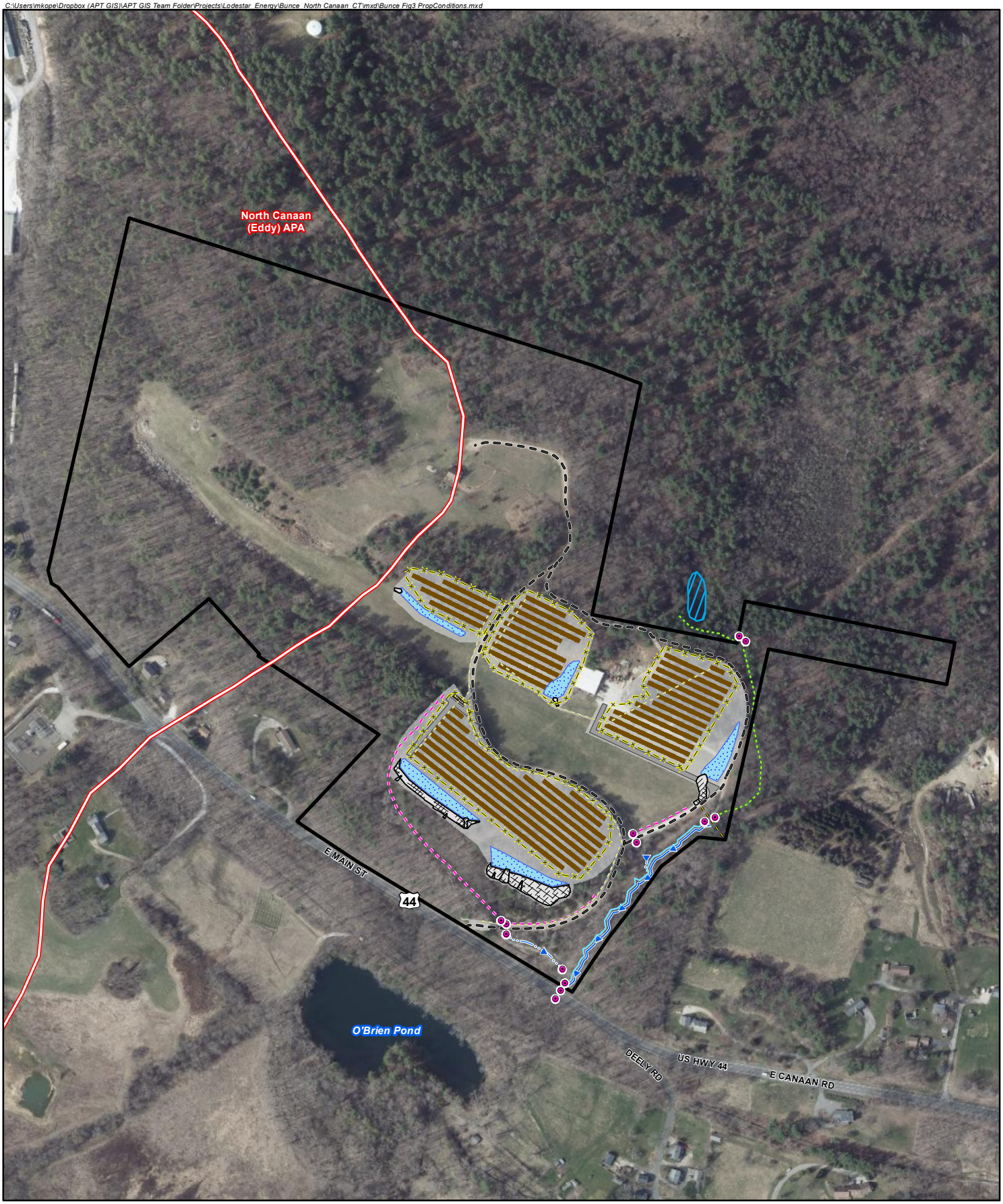
3.1 Habitat and Wildlife

Four (4) habitat types (vegetative communities) have been identified on the Site, all of which occur to some degree within the Project Area. These habitats were evaluated during multiple field inspections in January, March, April and July 2021; habitat types identified beyond the Project Area were generally assessed using remote sensing and publicly available datasets.

The habitats occupying the Site include:

- Developed
- Hayfield
- Field – Forest Edge
- Forested Areas (comprised of)
    - Forested Wetland
    - Mixed Hardwood-White Pine Forest
    - White Pine-Mixed Hardwood Forest

Wetlands and watercourses are described in detail in Section 3.3.1 of this report.



Legend

- Site
- Existing Dirt Driveway
- Existing Woods Road
- Existing Drainage Ditch
- Delineated Bank Boundary (OHWM)
- Approximate Wetland Boundary
- Aquifer Protection Area (Nov 2020)
- Interconnection Path (UD)
- Perimeter Fence
- Solar Modules
- Conc. Equip. Pad
- Gravel Access Road
- Stormwater Basin
- Riprap Slope Protection
- Vernal Pool
- Existing Culvert
- Perennial Stream
- Delineated Intermittent Watercourse
- Limit of Distrurbance

Map Notes:
Base Map Source: 2019 Aerial Photograph (CTECO)
Map Scale: 1 inch = 400 feet
Map Date: October 2021

N

400 200 0 400 Feet

Figure 3
Proposed Conditions Map

Proposed Solar Facility
81 East Main Street
North Canaan, Connecticut

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3.1.1 Habitat Types

Developed

Several areas of the Site have been classified as developed as they include buildings and associated lawn and landscaped areas. These areas also include areas of equipment storage and material stockpiles.

Hayfield

A hayfield totaling 8.2 acres lies in the central portion of the Site, atop a flat to gently sloping terrace. The area is utilized by the property owner primarily as a small aircraft runway and the vegetation is maintained low to the ground via frequent mowing. The vegetation consists of non-native cool season grasses including fescues (*Festuca spp.*).

Field – Forest Edge

This habitat, lying along the ecotone between the forest and field edges, consists of late old field dominated by shrubs and herbaceous vegetation interspersed with sapling trees. Much of these areas is disturbed and includes areas of large log and brush piles as well as stone piles. These areas are dominated by non-native invasive shrubs including autumn olive (*Elaeagnus umbellata*), morrow's honeysuckle (*Lonicera morrowii*), and multiflora rose (*Rosa multiflora*), along with native eastern red cedar (*Juniperus virginiana*). The herb and vine layer includes grapevine (*Vitis sp.*), little bluestem (*Schizachyrium scoparium*), bedstraw (*Galium sp.*) and Queen Anne's lace (*Daucus carota*) along with the invasive Asiatic bittersweet (*Celastrus orbiculatus*) and mugwort (*Artemisia vulgaris*).

Forested Areas

Three (3) distinct forested habitats are located on the Site, including forested wetland, mixed hardwood-white pine forest, and white pine-mixed hardwood forest. Forested wetland habitat is described in Section 3.3.1 of this report; upland forested areas are described below.

Mixed Hardwood – White Pine Forest

This habitat type consists of mature second growth forest dominated by mixed hardwood trees, but with a high percentage of eastern white pine (*Pinus strobus*). This is the dominant habitat on the Site, but is intermingled with white pine-mixed hardwood forest, in which white pine is dominant over the hardwood tree species.

Trees are mature in size (sawtimber with an average size greater than 14 inches dbh[4]), with the dominant species consisting of ash (*Fraxinus sp.*), white pine, black cherry (*Prunus serotina*), cottonwood (*Populus deltoides*), sugar maple (*Acer saccharum*), hickory (*Carya sp.*), white oak (*Quercus alba*), red oak (*Quercus rubra*), black oak (*Quercus velutina*) and gray birch (*Betula populifolia*). The shrub and midstory layers are dominated by invasive species, particularly where increased sun exposure to the forest floor is present. These include Japanese barberry (*Berberis thunbergii*), multiflora rose, morrow's honeysuckle and autumn olive. Native shrub and midstory tree species include witch-hazel (*Hamamelis virginiana*), eastern red cedar, spicebush (*Lindera benzoin*) and striped maple (*Acer pensylvanicum*). The herb and vine cover includes Christmas fern (*Polystichum acrostichoides*), sensitive fern (*Onoclea sensibilis*), poison ivy (*Toxicodendron radicans*), Asiatic bittersweet (*Celastrus orbiculatus*) and grapevine.

White Pine – Mixed Hardwood Forest

This habitat type consists of the same species complex described in the mixed hardwood forest-white pine habitat type, with white pine being the dominant over the hardwood tree species.

Table 1, *Habitat Areas Table* provides the total acreages of each habitat type located on the Site within and in proximity to the Project Area.

Table 1: Habitat Areas

Habitat Areas		
Habitat Type	Total Area On-Site (+/- ac.)	Area Occupied by Project (+/- ac.)
Developed	11.4	2.6
Hayfield	8.2	1.6
Field - Forest Edge	2.0	0.1
Forested Wetland	0.5	0.0
Mixed Hardwood-White Pine Forest	34.5	4.4
White Pine-Mixed Hardwood Forest	10.8	2.9

[4] Diameter at breast height

3.1.2 Core Forest Determination

APT evaluated the size and extent of the contiguous interior forest block present within and adjacent to the Site using two (2) publicly available GIS-based datasets designed to assess impacts to core forest habitat. In addition, an independent evaluation was performed (based on GIS analysis of 2016 leaf-off aerial photography, field observations and professional experience). The results of these analyses demonstrate no core forest exists on the Site.

The first dataset, the DEEP's *Forestland Habitat Impact Mapping*[5], does not depict an area mapped as core forest on the Site.

The second dataset, UConn's Center for Land Use Education and Research's ("CLEAR") Forest Fragmentation Analysis ("FFA")[6] study, designates "core forest" as greater than 300 feet from non-forested habitat. This 300-foot zone is referred to as the "edge width" and represents sub-optimal breeding habitat for forest-interior birds due to decreased forest quality, increased levels of disturbance, and increased rates of nest predation and brood parasitism within this transitional forest edge. The FFA study identifies three categories of core forest: small (< 250 acres); medium (250-500 acres); and large (>500 acres). Based on the FFA criteria, the Site only contains edge forested habitat as a result of existing development. This is consistent with APT's independent analysis, which indicates that no core forest is located on the Site.

Project development will require approximately 7.3 acres of tree clearing within areas that are currently edge forested habitat. As a result, no impacts to core forested resources will occur.

[5] Source: http://ctdeep.maps.arcgis.com/apps/webappviewer/index.html?id=7b81844bab634281b544c20bf2d7bfb8: This spatial screening layer identifies prime contiguous and connected core forestland blocks. If the project intersects with the Forestland Habitat Impact Map there is a potential for material effects to core forest.

[6] CLEAR's FFA: http://clear.uconn.edu/projects/landscape/forestfrag/forestfrag_public%20summary.pdf

3.1.3 Wildlife

Development of the proposed Facility will alter each of the four (4) habitat types located on Site. Project-related activities proposed within developed portions of the Site, as well as the hay field and field-forest edge habitat are not anticipated to adversely affect wildlife since these areas currently provide limited value from a wildlife utilization standpoint as a result of frequent management and disturbances.

The edge forest habitat prevalent on the Site provides higher quality habitat for species that are more tolerant of human disturbance, habitat fragmentation and resultant "edge" effects. Generalist wildlife species, including several song birds and mammals such as raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), grey squirrel (*Sciurus carolinensis*), Virginia opossum (*Didelphus virginiana*), and eastern chipmunk (*Tamias striatus*) could be expected to use these areas of the Site.

Noise and associated human activities during construction may result in limited, temporary disruption to wildlife using these nearby habitats. However, ongoing operation of the Facility will not result in a likely adverse effect in these nearby habitats as the Facility is unoccupied.

3.2 Rare Species

APT reviewed publicly available information to determine the potential presence of state/federally listed species and critical habitat on or proximate to the Site.

3.2.1 Natural Diversity Data Base

The DEEP Natural Diversity Data Base ("NDDB") program performs hundreds of environmental reviews each year to determine the impact of proposed development projects on state listed species and to help landowners conserve the state's biodiversity. In furtherance of this endeavor, the DEEP also developed maps to serve as a pre-screening tool to help Petitioners determine if there is the potential for project-related impact to state-listed species.

The NDDB maps represent approximate locations of (i) endangered, threatened and special concern species and, (ii) significant natural communities in Connecticut. The locations of species and natural communities depicted on the maps are based on data collected over the years by DEEP staff, scientists, conservation groups, and landowners. In some cases, an occurrence represents a location derived from literature, museum records and/or specimens. These data are

compiled and maintained in the NDDB. The general locations of species and communities are symbolized as shaded (or cross-hatched) polygons on the maps. Exact locations have been masked to protect sensitive species from collection and disturbance and to protect landowner's rights whenever species occur on private property.

APT reviewed the DEEP NDDB mapping (June 2020), which revealed that a NDDB polygon is located to the south of Route 44. A review request was submitted to DEEP NDDB; in response DEEP NDDB issues a determination that there are no reported populations of state or federal listed species on this property (NDDB Determination No.: 202009902, dated August 28, 2020). The NDDB indicated that there are populations of two (2) state-listed fish species associated with the Blackberry River, which is located south of the Site across East Main Street, approximately 1,600 feet from the property. The agency recommended the Petitioner consult with a CT DEEP Fisheries biologist if stormwater generated at the Site will be discharged to the Blackberry River. On June 23rd, 2021, Petitioner held a pre-application meeting with CT DEEP Office of Planning and Program Development, with participation from staff of several groups within the agency, including CT DEEP Fisheries. During this call, CT DEEP Fisheries biologist Matthew Goclowski stated that impact would be minimal if any and that there would be no further consultation required at this time.

An email copy of this communication is included as Attachment B, *CT DEEP Office of Planning and Program Development Correspondence*.

3.2.2 USFWS Consultation

The US Fish and Wildlife Service ("USFWS") was also consulted to determine if any federal-listed[7] species are known to occur proximate to the Site. The federal consultation was completed through the U.S. Fish and Wildlife Service's ("USFWS") Information, Planning, and Conservation System ("IPaC").

Based on the results of the IPaC review, two federally-listed threatened species are known to occur in the vicinity of the Site: northern long-eared bat ("NLEB"; *Myotis septentrionalis*) and Bog Turtle (*Clemmys muhlenbergii*). APT performed an evaluation to determine if the proposed referenced Facility would result in a likely adverse effect to NLEB and Bog Turtle.

Northern long-eared bat

[7] Listing under the federal Endangered Species Act

The NLEB is a federally-listed threatened species also known to occur in the vicinity of the Site. The NLEB's range encompasses the entire State of Connecticut and suitable NLEB roost habitat includes trees (live, dying, dead, or snag) with a diameter at breast height ("DBH") of three (3) inches or greater.

APT reviewed the DEEP's publicly available *Northern long-eared bat areas of concern in Connecticut to assist with Federal Endangered Species Act Compliance* map (February 1, 2016) to determine the locations of any known maternity roost trees or hibernaculum in the state. This map reveals that there are currently no known NLEB maternity roost trees in Connecticut. The nearest NLEB habitat resource to the Site is located in Salisbury, approximately 2.73 miles to the southwest.

The Project will result in clearing of approximately 7.3 wooded acres. Since tree removal activities can potentially impact NLEB habitat, APT completed a determination of compliance with Section 7 of the Endangered Species Act of 1973 for the Project.

In compliance with the USFWS criteria for assessing NLEB, the Project will not likely result in an adverse effect or incidental take[8] of NLEB and does not require a permit from USFWS.

Bog Turtle

A Biological Assessment was performed for Bog Turtle through the IPaC system. The "Bog Turtle (*Clemmys muhlenbergii*), Northern Population, Recovery Plan" (prepared by Michael Klemens, Ph.D. and dated May 15, 2001) and Amphibians and Reptiles of Connecticut and Adjacent Regions (Klemens, 1993) identifies bog turtle habitat as "*calcareous wet meadows, pastures, and fens, usually bordered by shrub and red-maple swamps… [that are] characterized by a continuous flow of water seeping through the saturated surface soil and [contain] an extremely diverse vegetational community*" and *"Bog Turtles inhabit small pockets of open-canopy habitat located within these diverse and dynamic wetland ecosystems.*".

The Project would not impact any wetland habitat. One wetland area, characterized by a perennial watercourse system, was identified east of the existing access drive. Although this watercourse system is developed in limestone (calcareous) soils, it does not contain wet meadow or fen habitat and therefore does not support preferred Bog Turtle habitat. Therefore, since no suitable habitat for Bog

[8] "Incidental take" is defined by the Endangered Species Act as take that is "incidental to, and not the purpose of, the carrying out of an otherwise lawful activity." For example, harvesting trees can kill bats that are roosting in the trees, but the purpose of the activity is not to kill bats.

Turtle is supported within the Project Area, the proposed development would result in "No effect" to this species and no further consultation with USFWS is required.

A full review of the *Endangered Species Act (ESA) Compliance Determination* and *Biological Assessment Report* are provided in Attachment C, *USFWS and NDDB Compliance Statement*.

3.3 Water Resources

3.3.1 Wetlands and Watercourses

Field inspections of Site wetlands and watercourses were completed in January, April and July 2021 by Eric Davison, a certified soil scientist. The results of these inspections are summarized below.

Forested Wetland

Palustrine forested wetlands (a.k.a. wooded swamps) occur along the northeastern Site boundary and drain in a southerly direction to a perennial stream. These wetlands continue offsite where most of the wetland occurs. Wetland hydrology ranges from *saturated* to *seasonally flooded*. The tree canopy is dominated by red maple (*Acer rubrum*), eastern hemlock (*Tsuga canadensis*), green ash (*Fraxinus pennsylvanica*) and American elm (*Ulmus americana*). The shrub and ground cover layers are dominated by spicebush, Japanese barberry, Morrow's honeysuckle, skunk cabbage (*Symplocarpus foetidus*) and tussock sedge (*Carex stricta*).

Intermittent Watercourses and Drainage Ditches

Bordering the access road into the Site are a series of anthropogenic drainage ditches, one of which was demarcated as an intermittent watercourse. These ditches were created to control surface runoff relative to the access road and carry flows to the stream. They are largely unvegetated, with eroded sand and gravel that discharges from the unpaved access road. These features are strictly flow conveyance features, with no habitat function. They do not contain base flow and do not provide habitat for aquatic species.

Perennial Stream

Located along the southeastern Site boundary is an unnamed first-order perennial stream that carries flows from the onsite forested wetlands, as well as wetlands further to the northeast, and drains south across Route 44 to the Blackberry River. The stream is steeply sloping, has a near linear north-south channel alignment, and a substrate dominated by large stones (from cobble

size to boulders). The channel is well-defined with no bordering wetlands due to the steep topography. The streamside vegetation consists of hardwood trees, identical to the species assemblage present with the mixed hardwood forest habitat.

Vernal Pool

A single vernal pool was identified just beyond the northern Site boundary. It was investigated on April 9, 2021. Due to its location on an adjoining parcel, observations were made from the property limits, primarily using binoculars. The pool was confirmed to contain two common vernal pool indicator species, the wood frog (*Lithobates sylvaticus*) and spotted salamander (*Ambystoma maculatum*), as egg masses of both species were visible floating atop woody vegetation on the pool's surface. The facultative species spring peeper (*Psuedacris cruficer*) and the wetland generalist species green frog (*Lithobates clamitans*) were also observed near the pool.

Existing Condition

In order to assess the vernal pool qualitatively, the methodology described in *Best Development Practices, Conserving Pool-Breeding Amphibians in Residential and Commercial Developments in the Northeastern United States* (Calhoun and Klemens, 2002, a.k.a. the BDP) was used. This assessment methodology utilizes a three-tiered rating system, with the tier designation determined by examining the biological value of the pool in conjunction with the condition of the habitat surrounding the pool, which is the area used by vernal pool amphibians during the non-breeding season. The higher the species diversity and abundance coupled with an undeveloped and forested landscape surrounding the pool, the higher the tier rating. Tier 1 pools are considered the highest quality pools, while Tier 3 are the lowest.

During the offsite survey work, the presence of egg masses of two vernal pool indicator species, the wood frog and the spotted salamander were noted. Therefore, the pool meets the biological criteria (BDP, pg. 9, Section A) of a Tier 1 vernal pool.

The landscape condition portion of the BDP assessment (BDP, pg. 9, Section B) considers the level of development within 750 feet surrounding vernal pools. The assessment considers two management zones, referred to as the *Vernal Pool Envelope* (VPE, 0-100 feet) and the *Critical Terrestrial Habitat* (100-750 feet). The pool's VPE zone presently has 11% development and the CTH zone has 15.7% development. Therefore, the pool meets the Tier 1 landscape condition criteria.

Post-Development Condition

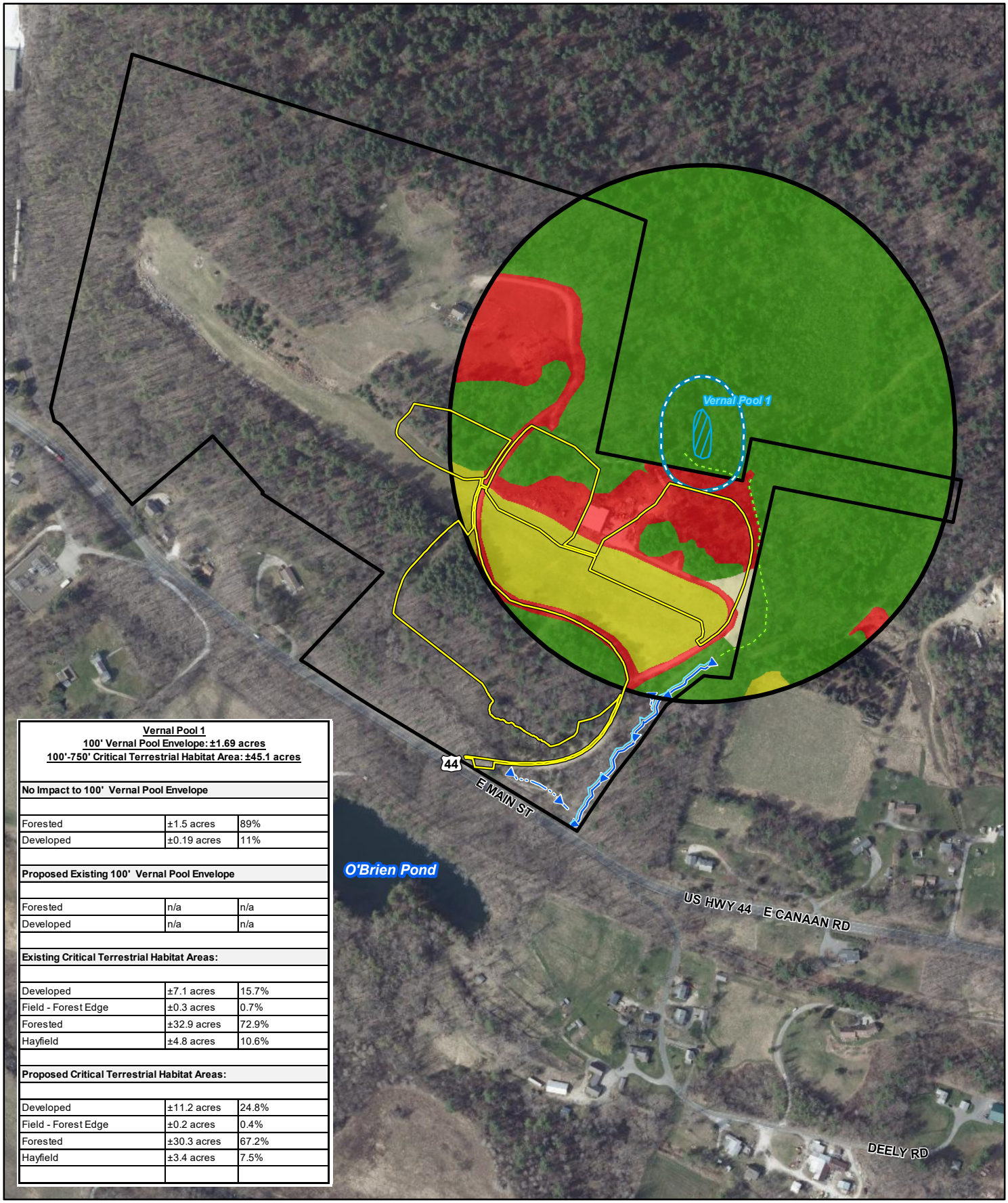
No activity is proposed within the pool's VPE management zone (0-100 feet). This will protect habitat that is critical to preserving vernal pool water quality, shading and detritus sources. This area also provides habitat for breeding adults entering and exiting the pool as well as emerging metamorphs exiting the pool to migrate to suitable upland habitat.

Approximately 4.1 acres of Project development (less than 10%) is proposed within the CTH zone, which will increase total development within this zone from 15.7% to 24.8% (9.1% increase). This post-development habitat alteration complies with the BDP guidelines, as it proposes no development within the VPE Zone and less than 25% development within the CTH Zone. The breakdown of habitat loss per habitat type is noted below in Table 2 and Figure 4.

Table 2: Effects on Vernal Pool CTH

Habitat Type	Acreage loss
Field-forest edge habitat	0.10
Forest	2.6
Hayfield	1.4

As noted in Table 2, only a small area (2.6 acres) of CTH terrestrial forest suitable for non-breeding habitat will be affected. The remainder of the habitat conversion will fall within the hayfield which does not provide terrestrial amphibian habitat (due to a lack of cover, shade and appropriate moisture), aside from transitory use during periods of overland movement (i.e., migration or population dispersal). Also noteworthy is that most of the affected forest occurs in two areas that are presently sub-optimal due to existing habitat fragmentation and are therefore not anticipated to be critical habitat areas for either species. The affected forest patches consist of: (1) a narrow forest strip located between the hayfield to the south and developed areas to the north and west; and (2) an area just south of the hayfield, at the outer limits of the CTH zone where amphibian densities can be expected to be lower (due to the distance from the pool, and the fact that animals would have to travel across the entire width of the hayfield to utilize the habitat). It stands to reason that the majority of high-use habitat for both indicator species is the large interrupted forest block located north of the pool, which is offsite and will be unaffected by the proposed Project.



Vernal Pool 1 100' Vernal Pool Envelope: ±1.69 acres 100'-750' Critical Terrestrial Habitat Area: ±45.1 acres		
No Impact to 100' Vernal Pool Envelope		
Forested	±1.5 acres	89%
Developed	±0.19 acres	11%
Proposed Existing 100' Vernal Pool Envelope		
Forested	n/a	n/a
Developed	n/a	n/a
Existing Critical Terrestrial Habitat Areas:		
Developed	±7.1 acres	15.7%
Field - Forest Edge	±0.3 acres	0.7%
Forested	±32.9 acres	72.9%
Hayfield	±4.8 acres	10.6%
Proposed Critical Terrestrial Habitat Areas:		
Developed	±11.2 acres	24.8%
Field - Forest Edge	±0.2 acres	0.4%
Forested	±30.3 acres	67.2%
Hayfield	±3.4 acres	7.5%

Legend

- Site
- Project Area
- Vernal Pool
- 100' Vernal Pool Envelope
- 100'-750' Critical Terrestial Habitat Area
- Approximate Wetland Boundary
- Delineated Bank Boundary (OHWM)
- Delineated Intermittent Watercourse
- Perennial Stream
- Open Water (CTDEEP)

Habitat Type

- Developed
- Field - Forest Edge Habitat
- Forested
- Hayfield

N

400 200 0 400 Feet

Figure 4
Vernal Pool Analysis Map

Proposed Solar Facility
81 East Main Street
North Canaan, Connecticut

Map Notes:
Base Map Source: 2019 Aerial Photograph (CTECO)
Map Scale:1 inch equals 400 feet
Map Date: October 2021

LODESTAR ENERGY

ALL-POINTS TECHNOLOGY CORPORATION

Effects on Water Resources

No direct impacts to wetlands or watercourses are associated with developing the Facility. Upon completion of the Facility, the nearest portion of the fenced facility would be approximately 44 feet to the wetland boundary along the northeast edge of the Site. This area is currently maintained by the property owner for use as a driveway and lawn. During construction, the limits of disturbance would coincide with the outside edge of the existing cleared access, approximately 20 feet from the wetland. The nearest construction activities are more than 65 feet from the perennial stream. Once constructed the Facility's fence would be set back a minimum of 147 feet from the stream. Table 3, *Proximity to Water Resources*, provides a summary of distances to wetland resources.

Table 3: Proximity to Water Resources

Wetland Impacts		
Direct Impacts to Wetlands and Watercourses	0	
Project Proximity to Resources (from limit of disturbance)	Distance (+/-ft.)	Direction (of wetland/water from LOD)
Approximate Wetland Boundary	20	East
Perennial Stream	67	Southeast
Solar Installation Proximity to Resources (from perimeter fence)	Distance (+/-ft.)	Direction (of wetland/water from perimeter fence)
Approximate Wetland Boundary	44	Northeast
Perennial Stream	147	Southeast

Any potential indirect impacts associated with the Project's construction activities will be minimized by the proper installation and maintenance of proposed E&S controls, in accordance with the 2002 *Connecticut Guidelines for Soil Erosion and Sediment Control*.

3.3.2 Floodplain Areas

APT reviewed the United States Federal Emergency Management Agency ("FEMA") Flood Insurance Rate Map ("FIRM") covering the Site. A FIRM is the official map of a community on which FEMA has delineated both the special hazard areas and risk premium zones applicable to the community. The area inclusive of the Site is mapped on FIRM PANELS #09014C0018C and # 090140014C, both dated January 2, 2008. Based upon the reviewed FIRM Maps, the proposed

Project Area is located in an area designated as unshaded Zone X, which is defined as areas of minimal flooding, typically above the 500-year flood level.

The Project Area is not located within a 100- and 500-year flood zone. Therefore, no special considerations or precautions relative to flooding are required for the Project.

3.4 Water Quality

As discussed in this section, the Project will comply with DEEP's water quality standards. Once operative, the Facility will be unstaffed, and no potable water uses or sanitary discharges are planned. No liquid fuels are associated with the operation of the Facility. Stormwater generated by the proposed development will be properly handled and treated in accordance with the 2004 *Connecticut Stormwater Quality Manual* and Appendix I.

3.4.1 Groundwater

Groundwater underlying the Site is classified by publicly available DEEP mapping as "GA".[9] This classification indicates groundwater within the area is presumed to be suitable for human consumption without treatment. Based upon a review of available DEEP mapping, the eastern edge of the North Canaan (Eddy) Aquifer Protection Area extends onto the western portion of the Site but does not encompass any portion of the Project Area.

The Project will have no adverse environmental effect on ground water quality.

3.4.2 Surface Water

The Project will have no adverse environmental effect on surface water quality. Based upon DEEP mapping, the Site is located in Major Drainage Basin 6 (Housatonic River), Regional Drainage Basin 61 (Blackberry River), Sub Regional Drainage Basin 6100 (Blackberry River), and Local Drainage Basin 6100-00 (unnamed). An unnamed stream is located along the eastern Site boundary, which flows into O'Brien Pond south of Route 44, and eventually flows into the Blackberry River. The Blackberry River is classified by DEEP as a Class B surface waterbody.[10] The Project will have no effect on this surface waterbody.

[9] Designated uses in GA classified areas include existing private and potential public or private supplies of drinking water and base flow or hydraulically connected surface water bodies.

[10] Designated uses for B classified waterbodies include potential drinking water supply, fish and wildlife habitat, recreational use, agricultural and industrial supply and other legitimate uses including navigation.

Based upon the reviewed DEEP mapping, the western portion of the Site is located within a mapped Public Drinking Supply Watershed, the North Canaan (Eddy) Wellfield, a source of public drinking water that is maintained and operated by the Aquarion Water Company.

Encompassing some 463.7 acres of land, the North Canaan (Eddy) Wellfield is located in an aquifer that is comprised largely of water-bearing sand and gravel deposits. Vacant land and residential properties in the North Canaan (Eddy) Wellfield source water area presently account for approximately 48.6 percent of the land cover. Commercial development (26.4 percent) and agricultural land use (25.0 percent) account for the remainder of the land coverage in the source water area. Four public water supply wells serve this area.

During construction, E&S controls will be installed and maintained in accordance with the 2002 *Connecticut Guidelines for Soil Erosion and Sediment Control*. Once operative, stormwater will be managed in accordance with the 2004 *Connecticut Stormwater Quality Manual*.

3.4.3 Stormwater Management

In addition to the 2004 Connecticut Stormwater Quality Manual and 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, the Project has been designed to meet CT DEEP's General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities (GP) Appendix I. Combined, these address three (3) main concerns: stormwater runoff peak attenuation, water quality volume treatment, and erosion and sediment control during construction. Technical details, mapping, and HydroCAD modeling results are provided in the Stormwater Management Report submitted under separate cover. A summary of these results is provided below.

Stormwater Runoff Peak Attenuation

The potential for changes in runoff from the Site as a result of Project construction has been evaluated and addressed. For this Site it involves the disturbances associated with the Project Area, including Facility appurtenances and the electrical interconnection line. As there are four (4) separate fenced in solar arrays proposed on the Site, the analysis and design focused on distributed treatment from each area of disturbance as applicable. Clearing of trees is required for both the installation of the solar arrays as well as for reducing shading of the southern array. Overall, the Project will maintain existing hydrological conditions within the fenced array areas, as the majority of grading is proposed for stormwater management best management practices

(i.e., basins and diversion berms). Upon completion of construction, the Site will be stabilized using a mix of native flowering grasses and plants selected specifically for solar installations (Ernst Solar Farm Seed Mix), which will create a meadow condition. Appendix I requires that the hydrologic soil group be reduced by a half-drop in those areas subject to heavy machinery traffic (i.e., the solar field and access), which typically results in a higher curve number. In order to appropriately manage Site drainage, the Petitioner proposes five (5) stormwater management basins to capture and treat the runoff generated by the proposed fenced facility areas.

The stormwater calculations for the Project predict that the post-development peak discharges to the waters of the State of Connecticut for the 2-, 25-, 50- and 100- year storm events are less than the pre-development peak discharges. Therefore, the Project is not anticipated to result in any adverse conditions to the surrounding areas and properties.

Water Quality Volume Treatment

The Project design also provides for adequate treatment of water quality volume associated with effective impervious cover, which includes the proposed gravel access drive, concrete equipment pads, and proposed solar modules that are located on slopes that are greater than 15%. As noted above, five (5) stormwater management basins are proposed to provide the requisite treatment volumes associated with these features. Technical details, mapping, and HydroCAD modeling results are provided in the Stormwater Management Report submitted under separate cover.

Erosion and Sediment Control During Construction

To safeguard water resources from potential impacts during construction, the Petitioner is committed to implementing protective measures in the form of a Stormwater Pollution Control Plan ("SWPCP"), to be finalized and submitted to the Council, subject to approval by DEEP Stormwater Management. The SWPCP will include monitoring of established E&S controls that are to be installed and maintained in accordance with the 2002 *Connecticut Guidelines for Soil Erosion and Sediment Control*. The Petitioner will also apply for a *General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities* from DEEP.

Development of the Project requires minimal grading and ground disturbance. Nonetheless, the Petitioner proposes a phased erosion control plan utilizing a series of perimeter compost filter socks to manage drainage areas less than one (1) acre, and temporary sediment traps to manage drainage areas that are greater than one (1) acre but less than five (5) acres. Upon completion

of construction, the Site will be seeded with the permanent Ernst Solar Farm Seed Mix. The phased erosion control plan and details are provided in Attachment A, *Project Plans*.

With the incorporation of these protective measures, stormwater runoff from Project development will not result in an adverse impact to water quality associated with nearby surface water bodies.

3.5 Air Quality

The Site is currently a mix of developed, cleared and wooded land. Due to the nature of a solar energy generating facility, no air emissions will be generated during operations and, therefore, the operation of the Facility will have no adverse effects on air quality and no permit is required.

Temporary, potential, construction-related mobile source emissions will include those associated with construction vehicles and equipment. Any potential air quality impacts related to construction activities can be considered de minimis. Such emissions will, nonetheless, be mitigated using available measures, including, inter alia, limiting idling times of equipment; proper maintenance of all vehicles and equipment; and watering/spraying to minimize dust and particulate releases. In addition, all on-site and off-road equipment will meet the latest standards for diesel emissions, as prescribed by the United States Environmental Protection Agency.

3.6 Soils and Geology

All exposed soils resulting from construction activities will be properly and promptly treated in accordance with the *2002 Connecticut Guidelines for Soil Erosion and Sediment Control*. Prior to the removal of soils, the topsoil will be stripped, stockpiled, and spread over disturbed areas being seeded. It is anticipated that any excess material will be redistributed on Site. See *Attachment A, Project Plans.*

Surficial materials on the Site are generally comprised of thin till. Bedrock geology beneath the Site is mapped as Stockbridge Marble, Walloomsac Schist and Basal Marble (member of Salloomsac Schist).

Although not anticipated, in the event bedrock is encountered during Site development, drilling or pneumatic hammer would be the preferred method of rock removal. Blasting would only occur if necessary and would be conducted by a certified blasting specialist and in accordance with applicable regulations.

3.6.1 Prime Farmland Soils

In accordance with the Code of Federal Regulations, CFR Title 7, part 657, farmland soils include land that is defined as prime, unique, or farmlands of statewide or local importance based on soil type. They represent the most suitable land for producing food, feed, fiber, forage, and oilseed crops.

According to the Connecticut Environmental Conditions Online Resource Guide,[11] the southern portion of the Project Area contains approximately 2.8 acres of Prime Farmland Soils.

The majority of the Site has remained largely undeveloped. Recognizing that the Project has a useful life and could be considered temporary in nature, the Petitioner has proposed using minimally intrusive methods for construction of the Project. The use of a ground-mounted racking system for the installation of the solar panels and associated equipment minimizes the need for substantial grading.

Excavation and regrading activities are necessary within areas mapped as Prime Farmland Soils to facilitate Project development and construct the stormwater management features that allow the Project to comply with Appendix I. Topsoil removed from these areas will be segregated from underlying horizons, temporarily stockpiled and used as top dressing for reestablishing vegetation. No topsoil will leave the Site.

After its useful life, the Facility will be decommissioned and all of the disturbed areas will be reseeded with the same (or approved equivalent) blend as established within the rest of the Project Area. Implementation of these proposed design strategies demonstrates that the Project will not materially affect Prime Farmland Soils.

Table 4, *Farmland Soils Assessment* details the amount of farmland soils located on the Site and the within the footprint of the Project.

Table 4: Farmland Soils Assessment

Farmland Soils Assessment		
Farmland Soil Classification	Total Area On-Site (+/- ac.)	Area within Project Limits (+/- ac.)
Prime Farmland Soil Area	5.4	2.8

[11] Connecticut Environmental Conditions Online (CTECO) Resource Guide www.cteco.uconn.edu.

3.7 Historic and Archaeological Resources

At the request of APT, and on behalf of the Petitioner, Heritage Consultants LLC ("Heritage Consultants") reviewed relevant historic and archaeological information to determine whether the Site holds potential cultural resource significance. Their review of historic maps and aerial images of the Site, examination of files maintained by the Connecticut State Historic Preservation Office ("SHPO"), and a pedestrian survey of the Site revealed determined that no historic or archaeological resources will be affected by the Project.

The Phase 1A report has been submitted to SHPO and is included in Attachment D, *Cultural Resources Reconnaissance Survey Report.* The SHPO response to the report will be provided upon receipt.

3.8 Scenic and Recreational Areas

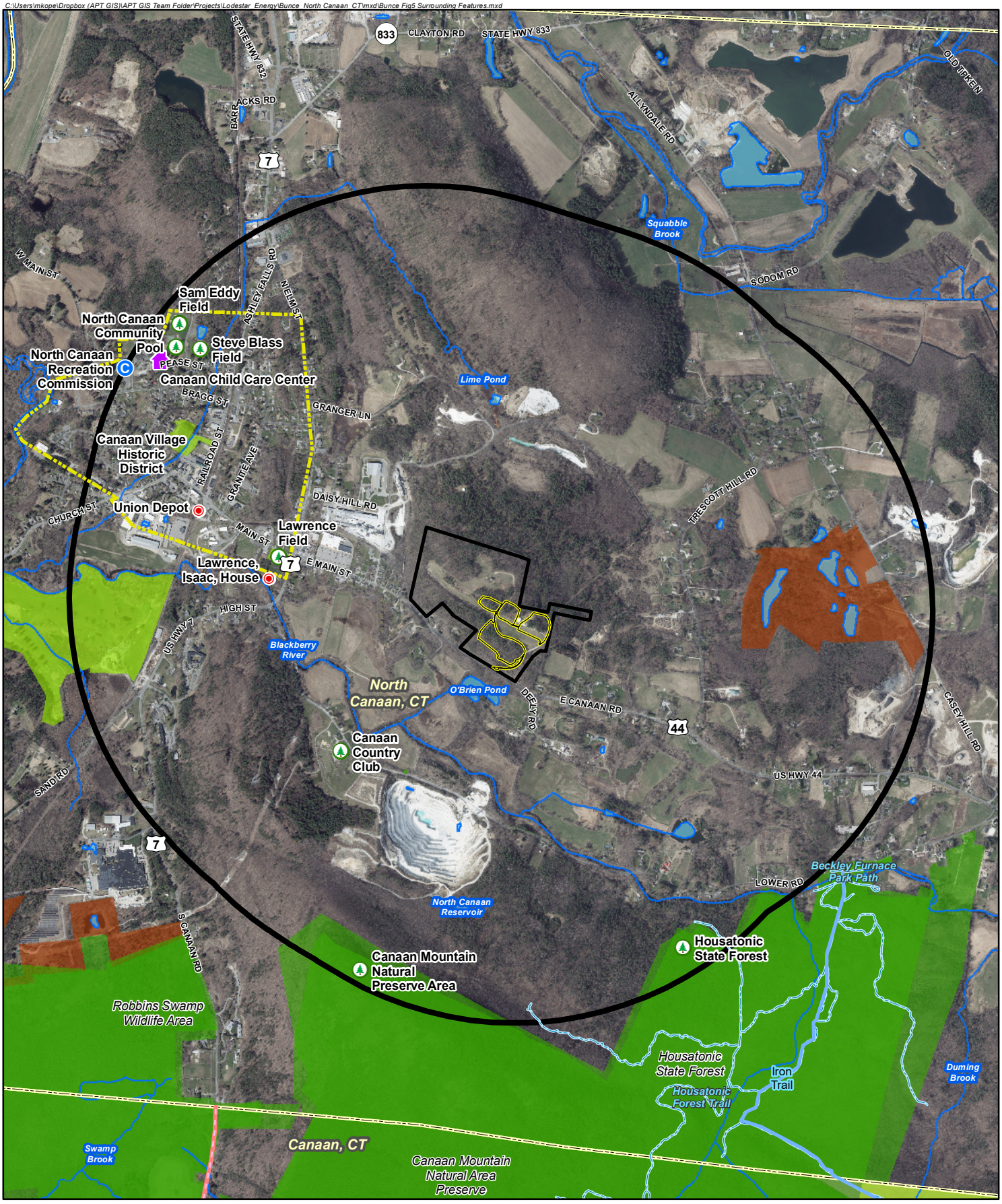
No state or local designated scenic roads or scenic areas are located near the Site and therefore none will be physically or visually impacted by development of the Project. No CT Blue Blaze Hiking Trails are located proximate to the Site.

Downtown North Canaan, located more than 0.5 mile to the west, contains a variety of recreational and historical resources. The nearest public open space is municipal property located approximately 0.9 mile west of the Site.

Impacts to any of these resources, either physical or visual, are not anticipated. See Figure 5, *Surrounding Features Map,* for these and other resources located within one mile of the Site.

3.9 Lighting

The Project area is currently unlit. No exterior lighting is planned for the Project. There will be some small, non-intrusive lighting fixtures within the equipment to aid in maintenance.



Legend

- Site
- Project Area
- 1 Mile Radius
- Municipal Boundary
- Canaan Village Historic District
- NRHP Building

Surrounding Features

- Daycare
- Community Center
- Park / Recreation / Open Space

Open Space Property (CTDEEP)

- Land Trust
- Municipal
- Private
- State

- Watercourse (CTDEEP)
- Open Water (CTDEEP)
- CT Blue Blaze Hiking Trail
- Hiking Trail

N

2,000 1,000 0 2,000 Feet

Figure 5
Surrounding Features Map

Proposed Solar Facility
81 East Main Street
North Canaan, Connecticut

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ALL-POINTS TECHNOLOGY CORPORATION

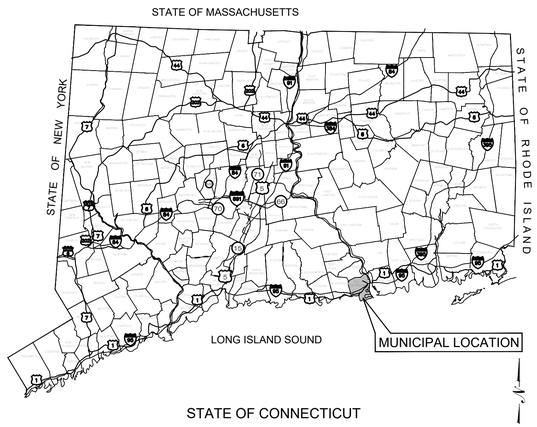
Map Notes:
Base Map Source: 2019 Aerial Photograph (CTECO)
Map Scale: 1 inch = 2,000 feet
Map Date: October 2021

4 Conclusion

As demonstrated in this Environmental Assessment, the Project will comply with the DEEP air and water quality standards. Further, it will not have an undue adverse effect on the existing environment and ecology; nor will it affect the scenic, historic and recreational resources in the vicinity of the Project.

ATTACHMENT A

PROJECT PLANS



LSE INDUS LLC

"BUNCE 1 SOLAR FACILITY"

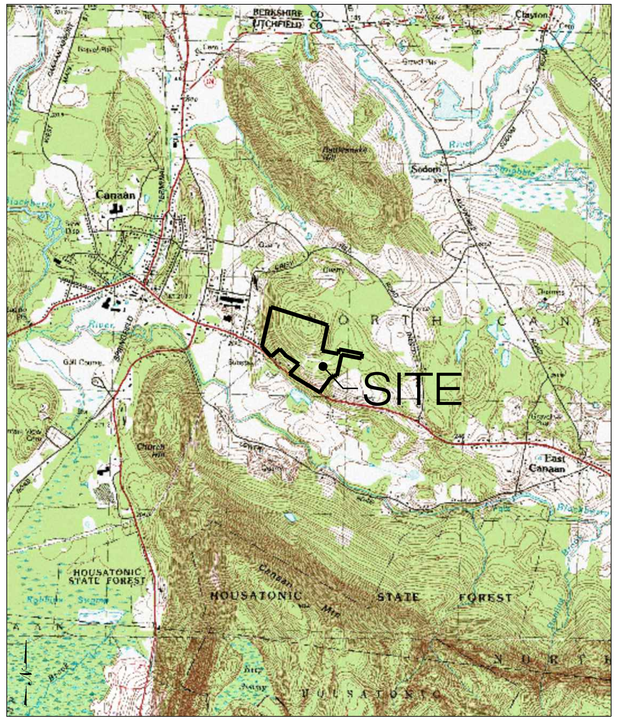
81 EAST MAIN ST
NORTH CANAAN, CT

LIST OF DRAWINGS

SITE INFORMATION

SITE NAME:	"BUNCE 1 SOLAR FACILITY"
LOCATION:	81 EAST MAIN ST NORTH CANAAN, CT
SITE TYPE/DESCRIPTION:	ADD (4) GROUND MOUNTED SOLAR PANEL ARRAY W/ ASSOCIATED EQUIPMENT, GRAVEL ACCESS ROAD, AND STORMWATER MANAGEMENT.
PROPERTY OWNER:	JOHN BUNCE 81 EAST MAIN ST NORTH CANAAN, CT
APPLICANT:	LSE INDUS LLC 40 TOWER LANE, SUITE 201 AVON, CT 06001
ENGINEER CONTACT:	KEVIN A. MCCAFFERY, P.E. (860) 663-1697 x228
LATITUDE: LONGITUDE:	42°1'18.16" N 73°18'46.48" W
MBLU: ZONE:	16-50-0 R-25
TOTAL SITE ACREAGE: TOTAL DISTURBED AREA:	67.41± AC. 11.62± AC.
APPROX. VOLUME OF CUT: APPROX. VOLUME OF FILL: APPROX. NET VOLUME:	7,216± CY 3,068± CY 4,148± CY OF CUT

USGS TOPOGRAPHIC MAP



SCALE : 1" = 2000'± SOURCE: NRCS LITCHFIELD CT DIGITAL RASTER GRAPHIC COUNTY MOSAIC, 2001

LSE INDUS LLC
40 TOWER LANE, SUITE 201
AVON, CT 06001

ALL-POINTS TECHNOLOGY CORPORATION
567 VAUXHALL STREET EXTENSION - SUITE 311
WATERFORD, CT 06385 PHONE: (860)-663-1697
WWW.ALLPOINTSTECH.COM FAX: (860)-663-0935

CSC PERMIT SET

NO	DATE	REVISION
0	10/19/21	FOR REVIEW: KAM
1		
2		
3		
4		
5		
6		

DESIGN PROFESSIONAL OF RECORD

PROF: KEVIN A. MCCAFFERY, P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION, P.C.
ADD: 567 VAUXHALL STREET EXTENSION - SUITE 311 WATERFORD, CT 06385

OWNER: JOHN BUNCE
ADDRESS: 81 EAST MAIN ST NORTH CANAAN, CT

BUNCE 1 SOLAR FACILITY

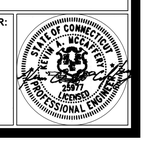
SITE ADDRESS: 81 EAST MAIN ST NORTH CANAAN, CT

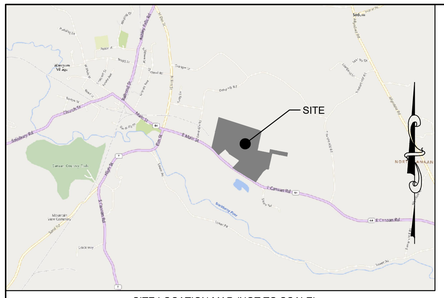
APT FILING NUMBER: CT606140

DRAWN BY: JT
DATE: 10/19/21 CHECKED BY: KAM

SHEET TITLE:
TITLE SHEET & INDEX

SHEET NUMBER:
T-1





SITE LOCATION MAP (NOT TO SCALE)

MAP NOTES:

1. THIS MAP AND SURVEY HAVE BEEN PREPARED PURSUANT TO THE REGULATIONS OF CONNECTICUT STATE AGENCIES SECTIONS 20-300b-1 THROUGH 20-300b-20 AND "THE MINIMUM STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT" ADOPTED JUNE 21, 1996; AMENDED OCTOBER 26, 2018.
2. THE TYPE OF SURVEY PERFORMED AND THE MAPPED FEATURES DEPICTED HEREON ARE IN ACCORDANCE WITH THE REQUIREMENTS OF AN PROPERTY/BOUNDARY & TOPOGRAPHIC SURVEY.
3. THE HORIZONTAL BASELINE CONFORMS TO A CLASS A-2 ACCURACY. THE VERTICAL BASELINE CONFORMS TO A CLASS V-2 ACCURACY. THE TOPOGRAPHIC FEATURES CONFORM TO A CLASS T-2 ACCURACY.
4. THE PROPERTY/BOUNDARY OPINION/DETERMINATION DEPICTED HEREON IS FIRST SURVEY AND CONFORMS TO A CLASS A-2 ACCURACY.
5. THE FEATURES DEPICTED AND NOTED HEREON ARE THE RESULT OF A FIELD SURVEY CONDUCTED IN FEBRUARY AND MARCH, 2021.
6. THE GROUND RELIEF CONTOURS DEPICTED HEREON ARE BASED UP THE LIDAR FLIGHT OF 2016 DATA SET CONDUCTED BY THE STATE OF CONNECTICUT AVAILABLE AT CT.ECO.UCONN.EDU. LIDAR ELEVATION WERE FIELD VERIFIED AT VARIOUS LOCATIONS THROUGHOUT THE SUBJECT PARCEL. CERTAIN AREAS WERE REVISED WITH A CONVENTIONAL FIELD SURVEY CONDUCTED ON SEPTEMBER 3, 2021..
7. THE WETLANDS DEPICTED HEREON WERE FIELD LOCATED WHILE CONDUCTING THE FIELD SURVEY AND HAVE BEEN DELINEATED BY ALL-POINTS TECHNOLOGY CORPORATION.

MAP NOTES (CONTINUED):

8. THE NORTH ARROW AND BEARINGS ARE BASED UPON THE CONNECTICUT STATE COORDINATE SYSTEM N.A.D. 1983 (2011). THE ELEVATIONS ARE BASED UPON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88) USING GEOID 12B. COORDINATES AND ELEVATIONS WERE DETERMINED FROM RTK GPS OBSERVATIONS MADE ON FEBRUARY 15, 2021, USING THE CT DOT RTK NETWORK KNOWN AS ACORN (MASH BASE), HAVING THE FOLLOWING VALUES:

   LATITUDE = N 42° 08' 25.75395"
   LONGITUDE= W 73° 21' 51.06342"
   ELLIPSOID HEIGHT = 175.592

9. UNDERGROUND UTILITIES, STRUCTURES AND FACILITY LOCATIONS DEPICTED AND NOTED HEREON ARE BASED UPON OBSERVABLE SURFACE EVIDENCE WHILE CONDUCTING THE FIELD SURVEY. THESE LOCATIONS MUST BE CONSIDERED AS APPROXIMATE IN NATURE. ADDITIONALLY, OTHER SUCH FEATURES MAY EXIST ON THE SITE, THE EXISTENCE WHICH IS UNKNOWN TO MARTIN SURVEYING ASSOCIATES, LLC.. ALL CONTRACTORS ARE REQUIRED TO CONTACT CALL-BEFORE-YOU-DIG AT 1-800-922-4455 FOR LOCATION AND OR STAKEOUT OF ANY UTILITY PRIOR TO ANY EXCAVATION.

MAP NOTES (CONTINUED);

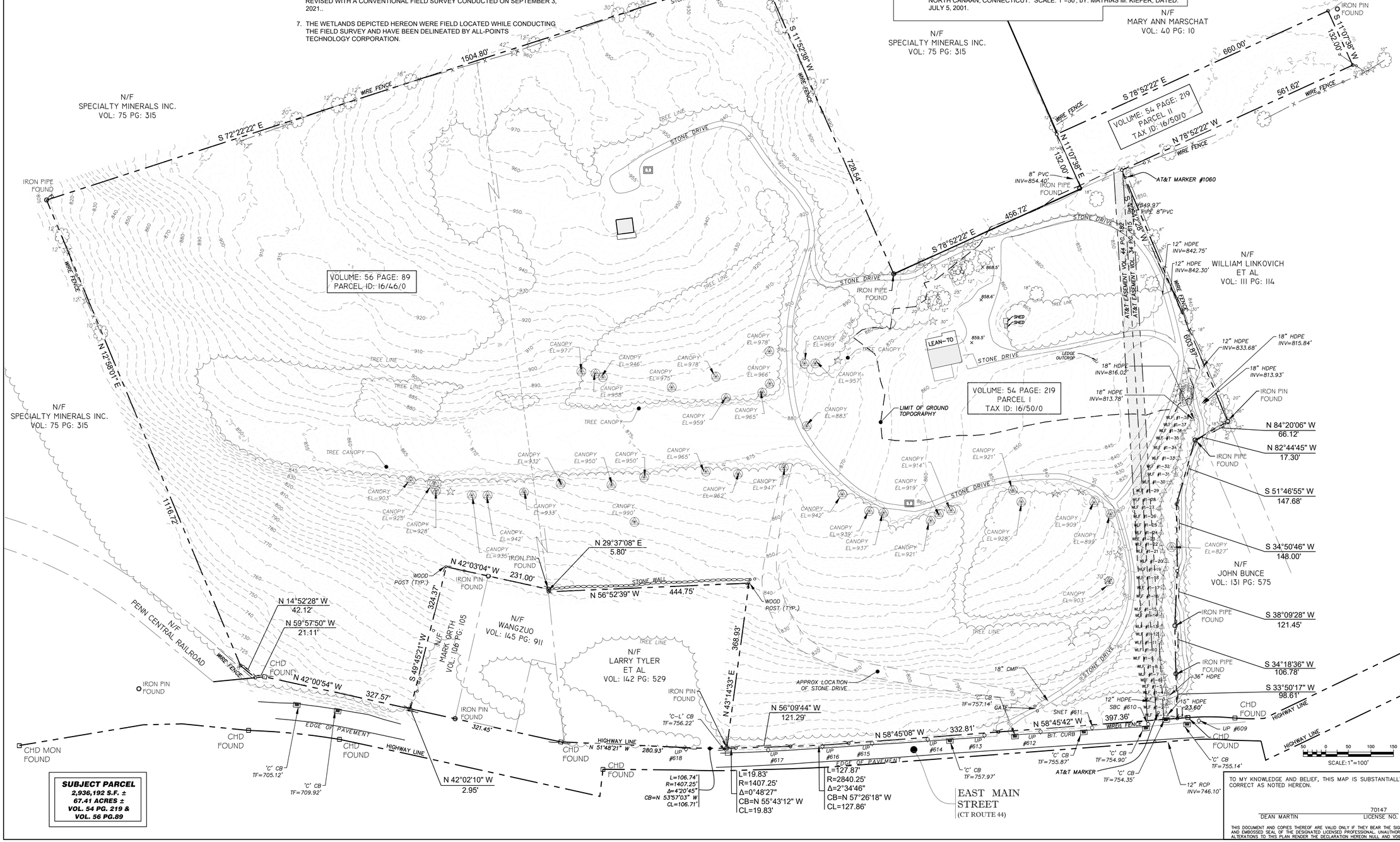
10. PARCEL IS SUBJECT TO RIGHT OF WAY AND EASEMENT TO THE AMERICAN TELEPHONE AND TELEGRAPH COMPANY AS DESCRIBED IN VOLUME 34 AT PAGE 415 AND TO A SECOND EASEMENT GRANTED TO SAID AMERICAN TELEPHONE AND TELEGRAPH COMPANY DATED MARCH 20, 1973 AND RECORDED MAY 24, 24, 1973 IN THE NORTH CANAAN LAND RECORDS. REFERENCE IS MADE TO A RIGHT TO CONSTRUCT AND MAINTAIN A TURNAROUND HAVING A 25 FEET RADIUS AS CENTERED ON A MANHOLE TO BE CONSTRUCTED. THIS SURVEY WAS CONDUCTED DURING THE WINTER MONTHS WITH SIGNIFICANT SNOW COVER. NO MANHOLE WAS FOUND AS OF THE FIELD SURVEY. SAID 25 FEET RADIUS IS NOT DEPICTED HEREON.

MAP REFERENCES:

A. "RIGHT OF WAY MAP TOWN OF NORTH CANAAN NORFOLK-CANAAN ROAD FROM THE R.R. UNDERPASS EASTERLY ABOUT 4,400 FEET ROUTE U.S. 44" (SHEETS 1 THROUGH 3). SCALE: 1" 40'; DATED: FEBRUARY 20, 1948; BY: CONNECTICUT STATE HIGHWAY DEPARTMENT.

B. "MAP OF LAND OF ELMER G. MORCK & RALPH MORCK VOL. 36 PG. 359 U.S. ROUTE 44 NORTH CANAAN, CONNECTICUT." SCALE: 1"=30', BY: DR. GEORGE D. ADOTTE, DATED: NOVEMBER 26, 1984.

C. "MAP PREPARED FOR ELSIE ROSE GHI #107 EAST CANAAN ROAD - ROUTE 44 NORTH CANAAN, CONNECTICUT." SCALE: 1"=50', bY: MATHIAS M. KIEFER, DATED: JULY 5, 2001.



LEGEND:

- IRON PIN (FOUND)
- Rebar/Drill Hole (To Be Set)
- MONUMENT (FOUND)
- MANHOLE
- DRAINAGE MANHOLE
- SANITARY MANHOLE
- ELEC. MANHOLE
- TELE. MANHOLE
- "C" CATCH BASIN
- "C-L" CATCH BASIN
- DECIDUOUS TREES
- EVERGREEN TREES
- SHRUB/BUSH
- FLAG POLE
- TRAFFIC CONTROL BOX
- SIGN
- POST
- LIGHT POLE
- GUY ANCHOR
- UTILITY POLE
- WATER GATE
- WATER METER
- GAS VALVE
- GAS METER
- TRANSFORMER
- ELEC. METER
- MAIL BOX
- HAND HOLE
- BUTTON BOX
- A.C. UNIT
- TRAFFIC LIGHT POLE
- BOUNDARY LINE
- GUARD RAIL
- UNDERGROUND PIPING (San.,Stm.)
- U/G GAS LINE
- U/G ELEC. LINE
- WATER LINE
- OVERHEAD UTILITIES
- U/G TELE. LINE
- CHAIN LINK FENCE
- TREE LINE

martin
Surveying Associates, LLC
201 CHRISTIAN LANE BERLIN, CT 06037
860-832-9328 860-357-4604 (FAX)

REVISIONS:
9/7/21 REVISED CONTOURS

PROPERTY & TOPOGRAPHIC SURVEY LAND OF JOHN BUNCE

81 EAST MAIN STREET NORTH CANAAN, CONNECTICUT

MSA PROJECT NO:

SCALE: 1" = 100'
DRAWN BY: G.S.D.
DATE: 4/6/2021
CHECKED BY: D.G.M.

SHEET: 1 OF 1

TO MY KNOWLEDGE AND BELIEF, THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON.

DEAN MARTIN 70147 LICENSE NO.

GENERAL NOTES

1. ALL CONSTRUCTION SHALL COMPLY WITH PROJECT DEVELOPER STANDARDS, TOWN OF NORTH CANAAN STANDARDS, CONNECTICUT DEPARTMENT OF TRANSPORTATION STANDARDS AND SPECIFICATIONS IN THE ABOVE REFERENCED INCREASING HIERARCHY. IF SPECIFICATIONS ARE IN CONFLICT, THE MORE STRINGENT SPECIFICATION SHALL APPLY.
2. IF NO PROJECT CONSTRUCTION SPECIFICATION PACKAGE IS PROVIDED BY THE PROJECT DEVELOPER OR THEIR REPRESENTATIVE, THE CONTRACTOR SHALL COMPLY WITH THE MANUFACTURER, TOWN OF NORTH CANAAN, OR CONNECTICUT DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS, AND BE IN ACCORDANCE WITH ALL APPLICABLE OSHA, FEDERAL, STATE AND LOCAL REGULATIONS.
3. THE PROJECT DEVELOPER IS RESPONSIBLE FOR OBTAINING ALL NECESSARY ZONING AND STORMWATER PERMITS REQUIRED BY GOVERNMENT AGENCIES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL OBTAIN ALL TOWN OF NORTH CANAAN CONSTRUCTION PERMITS. THE CONTRACTOR SHALL POST ALL BONDS, PAY ALL FEES, PROVIDE PROOF OF INSURANCE AND PROVIDE TRAFFIC CONTROL NECESSARY FOR THIS WORK.
4. REFER TO PLANS, DETAILS AND REPORTS PREPARED BY ALL-POINTS TECHNOLOGY CORPORATION FOR ADDITIONAL INFORMATION. THE CONTRACTOR SHALL VERIFY ALL SITE CONDITIONS IN THE FIELD AND CONTACT THE PROJECT DEVELOPER IF THERE ARE ANY QUESTIONS OR CONFLICTS REGARDING THE CONSTRUCTION DOCUMENTS AND/OR FIELD CONDITIONS SO THAT APPROPRIATE REVISIONS CAN BE MADE PRIOR TO BIDDING/CONSTRUCTION. ANY CONFLICT BETWEEN THE DRAWINGS AND SPECIFICATIONS SHALL BE CONFIRMED WITH THE PROJECT DEVELOPERS CONSTRUCTION MANAGER PRIOR TO CONSTRUCTION.
5. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OF ALL PRODUCTS, MATERIALS PER PLANS, AND SPECIFICATIONS TO THE PROJECT DEVELOPER FOR REVIEW AND APPROVAL PRIOR TO FABRICATION OR DELIVERY TO THE SITE. ALLOW A MINIMUM OF 14 WORKING DAYS FOR REVIEW.
6. SHOULD ANY UNKNOWN OR INCORRECTLY LOCATED EXISTING PIPING OR OTHER UTILITY BE UNCOVERED DURING EXCAVATION, CONSULT THE PROJECT DEVELOPER IMMEDIATELY FOR DIRECTIONS BEFORE PROCEEDING FURTHER WITH WORK IN THIS AREA.
7. DO NOT INTERRUPT EXISTING UTILITIES SERVICING FACILITIES OCCUPIED AND USED BY THE PROJECT DEVELOPER OR OTHERS DURING OCCUPIED HOURS, EXCEPT WHEN SUCH INTERRUPTIONS HAVE BEEN AUTHORIZED IN WRITING BY THE PROJECT DEVELOPER AND THE LOCAL MUNICIPALITY. INTERRUPTIONS SHALL ONLY OCCUR AFTER ACCEPTABLE TEMPORARY SERVICE HAS BEEN PROVIDED.
8. THE CONTRACT LIMIT IS THE PROPERTY LINE UNLESS OTHERWISE SPECIFIED OR SHOWN ON THE CONTRACT DRAWINGS.
9. THE CONTRACTOR SHALL ABIDE BY ALL OSHA, FEDERAL, STATE AND LOCAL REGULATIONS WHEN OPERATING CRANES, BOOMS, HOISTS, ETC. IN CLOSE PROXIMITY TO OVERHEAD ELECTRIC LINES. IF CONTRACTOR MUST OPERATE EQUIPMENT CLOSE TO ELECTRIC LINES, CONTACT POWER COMPANY TO MAKE ARRANGEMENTS FOR PROPER SAFEGUARDS. ANY UTILITY COMPANY FEES SHALL BE PAID FOR BY THE CONTRACTOR.
10. THE CONTRACTOR SHALL COMPLY WITH OSHA CFR 29 PART 1926 FOR EXCAVATION TRENCHING AND TRENCH PROTECTION REQUIREMENTS.
11. THE ENGINEER IS NOT RESPONSIBLE FOR SITE SAFETY MEASURES TO BE EMPLOYED DURING CONSTRUCTION. THE ENGINEER HAS NO CONTRACTUAL DUTY TO CONTROL THE SAFEST METHODS OR MEANS OF THE WORK, JOB SITE RESPONSIBILITIES, SUPERVISION OF PERSONNEL OR TO SUPERVISE SAFETY AND DO NOT VOLUNTARILY ASSUME ANY SUCH DUTY OR RESPONSIBILITY.
12. THE CONTRACTOR SHALL RESTORE ANY DRAINAGE STRUCTURE, PIPE, CONDUIT, PAVEMENT, CURBING, SIDEWALKS, LANDSCAPED AREAS OR SIGNAGE DISTURBED DURING CONSTRUCTION TO THEIR ORIGINAL CONDITION OR BETTER, AS APPROVED BY THE PROJECT DEVELOPER OR TOWN OF NORTH CANAAN.
13. THE CONTRACTOR SHALL PROVIDE AS-BUILT RECORDS OF ALL CONSTRUCTION (INCLUDING UNDERGROUND UTILITIES) TO THE PROJECT DEVELOPER AT THE END OF CONSTRUCTION.
14. ALTERNATIVE METHODS AND PRODUCTS, OTHER THAN THOSE SPECIFIED, MAY BE USED IF REVIEWED AND APPROVED BY THE PROJECT DEVELOPER, ENGINEER, AND APPROPRIATE REGULATORY AGENCY PRIOR TO INSTALLATION DURING THE BIDDING/CONSTRUCTION PROCESS.
15. INFORMATION ON EXISTING UTILITIES AND STORM DRAINAGE SYSTEMS HAS BEEN COMPILED FROM AVAILABLE INFORMATION INCLUDING UTILITY PROVIDER AND MUNICIPAL RECORD MAPS AND/OR FIELD SURVEY AND IS NOT GUARANTEED CORRECT OR COMPLETE. UTILITIES AND STORM DRAINAGE SYSTEMS ARE SHOWN TO ALERT THE CONTRACTOR TO THEIR PRESENCE AND THE CONTRACTOR IS SOLELY RESPONSIBLE FOR DETERMINING ACTUAL LOCATIONS AND ELEVATIONS OF ALL UTILITIES AND STORM DRAINAGE SYSTEMS INCLUDING SERVICES. PRIOR TO DEMOLITION OR CONSTRUCTION, THE CONTRACTOR SHALL CONTACT "CALL BEFORE YOU DIG" 72 HOURS BEFORE COMMENCEMENT OF WORK AT "811" AND VERIFY ALL UTILITY AND STORM DRAINAGE SYSTEM LOCATIONS.
16. NO CONSTRUCTION OR DEMOLITION SHALL BEGIN UNTIL APPROVAL OF THE FINAL PLANS AND PERMITS ARE GRANTED BY ALL GOVERNING AND REGULATORY AGENCIES.

SITE PLAN NOTES

1. THE SURVEY WAS PROVIDED BY MARTIN SURVEYING ASSOCIATES, LLC. DATED APRIL 6, 2021.
2. THERE ARE BORDERING VEGETATED WETLANDS (BVW/S) LOCATED ON THE SITE AS INDICATED ON THE PLANS. BVW BOUNDARIES WERE FLAGGED AND LOCATED BY ALL-POINTS TECHNOLOGY CORPORATION, IN APRIL AND JULY 2021.
3. THERE WILL BE MINIMAL GRADING ON SITE WITHIN THE ARRAY AREA IN THE AREAS OF THE MINOR CLEARING, TO ENSURE THAT PROPER DRAINAGE IS MAINTAINED. GRADING WILL BE PROPOSED FOR THE REQUIRED STORMWATER MANAGEMENT BEST MANAGEMENT PRACTICES.
4. THE CONTRACTOR SHALL FOLLOW THE RECOMMENDED SEQUENCE OF CONSTRUCTION NOTES PROVIDED ON THE EROSION CONTROL PLAN OR SUBMIT AN ALTERNATE PLAN FOR APPROVAL BY THE ENGINEER AND/OR PERMITTING AGENCIES PRIOR TO THE START CONSTRUCTION. ALLOW A MINIMUM OF 14 WORKING DAYS FOR REVIEW.
5. PROPER CONSTRUCTION PROCEDURES SHALL BE FOLLOWED ON ALL IMPROVEMENTS WITHIN THIS PARCEL SO AS TO PREVENT THE SILTING OF ANY WATERCOURSE OR BVWS IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS. IN ADDITION, THE CONTRACTOR SHALL ADHERE TO THE "EROSION CONTROL PLAN" CONTAINED HEREIN. THE CONTRACTOR SHALL BE RESPONSIBLE TO POST ALL BONDS AS REQUIRED BY GOVERNMENT AGENCIES WHICH WOULD GUARANTEE THE PROPER IMPLEMENTATION OF THE PLAN.
6. ALL SITE WORK, MATERIALS OF CONSTRUCTION, AND CONSTRUCTION METHODS FOR EARTHWORK AND STORM DRAINAGE WORK, SHALL CONFORM TO THE SPECIFICATIONS AND DETAILS AND APPLICABLE SECTIONS OF THE PROJECT SPECIFICATIONS MANUAL. OTHERWISE THIS WORK SHALL CONFORM TO THE STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION AND PROJECT GEOTECHNICAL REPORT IF THERE IS NO PROJECT SPECIFICATIONS MANUAL. ALL FILL MATERIAL UNDER STRUCTURES AND PAVED AREAS SHALL BE PER THE ABOVE STATED APPLICABLE SPECIFICATIONS, AND/OR PROJECT GEOTECHNICAL REPORT, AND SHALL BE PLACED IN ACCORDANCE WITH THE APPLICABLE SPECIFICATIONS UNDER THE SUPERVISION OF A QUALIFIED PROFESSIONAL ENGINEER. MATERIAL SHALL BE COMPACTED IN 8" LIFTS TO 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D 1557 AT 95% PERCENT OF OPTIMUM MOISTURE CONTENT.
7. ALL DISTURBANCE INCURRED TO PUBLIC, MUNICIPAL, COUNTY, STATE PROPERTY DUE TO CONSTRUCTION SHALL BE RESTORED TO ITS PREVIOUS CONDITION OR BETTER, TO THE SATISFACTION OF THE TOWN OF NORTH CANAAN AND STATE OF CONNECTICUT.
8. IF IMPACTED OR CONTAMINATED SOIL IS ENCOUNTERED BY THE CONTRACTOR, THE CONTRACTOR SHALL SUSPEND EXCAVATION WORK OF IMPACTED SOIL AND NOTIFY THE PROJECT DEVELOPER AND/OR PROJECT DEVELOPERS ENVIRONMENTAL CONSULTANT PRIOR TO PROCEEDING WITH FURTHER WORK IN THE IMPACTED SOIL LOCATION UNTIL FURTHER INSTRUCTED BY THE PROJECT DEVELOPER AND/OR PROJECT DEVELOPER'S ENVIRONMENTAL CONSULTANT.

UTILITY NOTES

1. CONTRACTOR IS RESPONSIBLE FOR CONTACTING THE TOWN OF NORTH CANAAN TO SECURE CONSTRUCTION PERMITS AND FOR PAYMENT OF FEES FOR STREET CUTS AND CONNECTIONS TO EXISTING UTILITIES.
2. REFER TO DRAWINGS BY PROJECT DEVELOPER FOR THE ONSITE ELECTRICAL DRAWINGS AND INTERCONNECTION TO EXISTING ELECTRICAL GRID. SITE CONTRACTOR SHALL SUPPLY AND INSTALL PIPE ADAPTERS AS NECESSARY AT BUILDING CONNECTION POINT OR AT EXISTING UTILITY OR PIPE CONNECTION POINT. THESE DETAILS ARE NOT INCLUDED IN THESE PLANS.
3. UTILITY LOCATIONS AND PENETRATIONS ARE SHOWN FOR THE CONTRACTOR'S INFORMATION AND SHALL BE VERIFIED WITH THE ELECTRICAL ENGINEER AND THE PROJECT DEVELOPER'S CONSTRUCTION MANAGER PRIOR TO THE START OF CONSTRUCTION.
4. THE CONTRACTOR SHALL VISIT THE SITE AND VERIFY THE ELEVATION AND LOCATION OF ALL UTILITIES BY VARIOUS MEANS PRIOR TO BEGINNING ANY EXCAVATION. TEST PITS SHALL BE DUG AT ALL LOCATIONS WHERE PROP. SANITARY SEWERS AND WHERE PROP. STORM PIPING WILL CROSS EXISTING UTILITIES, AND THE HORIZONTAL AND VERTICAL LOCATIONS OF THE UTILITIES SHALL BE DETERMINED. THE CONTRACTOR SHALL CONTACT THE PROJECT DEVELOPER IN THE EVENT OF ANY DISCOVERED OR UNFORESEEN CONFLICTS BETWEEN EXISTING AND PROPOSED SANITARY SEWERS, STORM PIPING AND UTILITIES SO THAT AN APPROPRIATE MODIFICATION MAY BE MADE.
5. UTILITY CONNECTION DESIGN AS REFLECTED ON THE PLAN MAY CHANGE SUBJECT TO UTILITY PROVIDER AND GOVERNING AUTHORITY STAFF REVIEW.
6. THE CONTRACTOR SHALL ENSURE THAT ALL UTILITY PROVIDERS AND GOVERNING AUTHORITY STANDARDS FOR MATERIALS AND CONSTRUCTION METHODS ARE MET. THE CONTRACTOR SHALL PERFORM PROPER COORDINATION WITH THE RESPECTIVE UTILITY PROVIDER.
7. THE CONTRACTOR SHALL ARRANGE FOR AND COORDINATE WITH THE RESPECTIVE UTILITY PROVIDERS FOR SERVICE INSTALLATIONS AND CONNECTIONS. THE CONTRACTOR SHALL COORDINATE WORK TO BE PERFORMED BY THE VARIOUS UTILITY PROVIDERS AND SHALL PAY ALL FEES FOR CONNECTIONS, DISCONNECTIONS, RELOCATIONS, INSPECTIONS, AND DEMOLITION UNLESS OTHERWISE STATED IN THE PROJECT SPECIFICATIONS MANUAL AND/OR GENERAL CONDITIONS OF THE CONTRACT.
8. ALL EXISTING PAVEMENT WHERE UTILITY PIPING IS TO BE INSTALLED SHALL BE SAW CUT. AFTER UTILITY INSTALLATION IS COMPLETED, THE CONTRACTOR SHALL INSTALL TEMPORARY AND/OR PERMANENT PAVEMENT REPAIR AS DETAILED ON THE DRAWINGS OR AS REQUIRED BY THE TOWN OF NORTH CANAAN.
9. ALL PIPES SHALL BE LAID ON STRAIGHT ALIGNMENTS AND EVEN GRADES USING A PIPE LASER OR OTHER ACCURATE METHOD.
10. RELOCATION OF UTILITY PROVIDER FACILITIES, SUCH AS POLES, SHALL BE DONE IN ACCORDANCE WITH THE REQUIREMENTS OF THE UTILITY PROVIDER.
11. THE CONTRACTOR SHALL COMPACT PIPE BACKFILL IN 8" LIFTS ACCORDING TO THE PIPE BEDDING DETAILS. TRENCH BOTTOM SHALL BE STABLE IN HIGH GROUNDWATER AREAS. A PIPE FOUNDATION SHALL BE USED PER THE TRENCH DETAILS AND IN AREAS OF ROCK EXCAVATION.
12. CONTRACTOR TO PROVIDE STEEL SLEEVES AND ANNULAR SPACE SAND FILL FOR UTILITY PIPE AND CONDUIT CONNECTIONS UNDER FOOTINGS.
13. ALL UTILITY CONSTRUCTION IS SUBJECT TO INSPECTION FOR APPROVAL PRIOR TO BACKFILLING, IN ACCORDANCE WITH THE APPROPRIATE UTILITY PROVIDER REQUIREMENTS.
14. A ONE-FOOT MINIMUM VERTICAL CLEARANCE BETWEEN WATER, GAS, ELECTRICAL, AND TELEPHONE LINES AND STORM PIPING SHALL BE PROVIDED. A SIX-INCH MINIMUM CLEARANCE SHALL BE MAINTAINED BETWEEN STORM PIPING AND SANITARY SEWER. A 6-INCH TO 18-INCH VERTICAL CLEARANCE BETWEEN SANITARY SEWER PIPING AND STORM PIPING SHALL REQUIRE CONCRETE ENCASEMENT OF THE SANITARY PIPING.
15. THE CONTRACTOR SHALL RESTORE ANY UTILITY STRUCTURE, PIPE, CONDUIT, PAVEMENT, CURBING, SIDEWALKS, DRAINAGE STRUCTURE, SWALE OR LANDSCAPED AREAS DISTURBED DURING CONSTRUCTION, TO THEIR ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE PROJECT DEVELOPER AND TOWN OF NORTH CANAAN.
16. INFORMATION ON EXISTING UTILITIES AND STORM DRAINAGE HAS BEEN COMPILED FROM AVAILABLE INFORMATION INCLUDING UTILITY PROVIDER AND MUNICIPAL RECORD MAPS AND/OR FIELD SURVEY, AND IS NOT GUARANTEED CORRECT OR COMPLETE. UTILITIES AND STORM DRAINAGE ARE SHOWN TO ALERT THE CONTRACTOR TO THEIR PRESENCE. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR DETERMINING ACTUAL LOCATIONS AND ELEVATIONS OF ALL UTILITIES AND STORM DRAINAGE INCLUDING SERVICES. CONTACT "CALL BEFORE YOU DIG" AT 811 72 HOURS PRIOR TO CONSTRUCTION AND VERIFY ALL UNDERGROUND AND OVERHEAD UTILITY AND STORM DRAINAGE LOCATIONS. THE CONTRACTOR SHALL EMPLOY THE USE OF A UTILITY LOCATING COMPANY TO PROVIDE SUBSURFACE UTILITY ENGINEERING CONSISTING OF DESIGNATING UTILITIES AND STORM PIPING ON PRIVATE PROPERTY WITHIN THE CONTRACT LIMIT AND CONSISTING OF DESIGNATING AND LOCATING WHERE PROP. UTILITIES AND STORM PIPING CROSS EXISTING UTILITIES AND STORM PIPING WITHIN THE CONTRACT LIMITS.
17. THE CONTRACTOR SHALL ARRANGE AND COORDINATE WITH UTILITY PROVIDERS FOR WORK TO BE PERFORMED BY UTILITY PROVIDERS. THE CONTRACTOR SHALL PAY ALL UTILITY FEES UNLESS OTHERWISE STATED IN THE PROJECT SPECIFICATION MANUAL AND GENERAL CONDITIONS, AND REPAIR PAVEMENTS AS NECESSARY.
18. ELECTRIC DRAWINGS AND REQUIREMENTS ARE NOT INCLUDED AS PART OF THIS DRAWING SET AND SHOULD BE OBTAINED FROM THE PROJECT DEVELOPER.
19. ALTERNATIVE METHODS AND PRODUCTS OTHER THAN THOSE SPECIFIED MAY BE USED IF REVIEWED AND APPROVED BY THE PROJECT DEVELOPER, ENGINEER, AND APPROPRIATE REGULATORY AGENCIES PRIOR TO INSTALLATION.
20. THE CONTRACTOR SHALL MAINTAIN ALL FLOWS AND UTILITY CONNECTIONS TO EXISTING BUILDINGS WITHOUT INTERRUPTION UNLESS/UNTIL AUTHORIZED TO DISCONNECT BY THE PROJECT DEVELOPER, TOWN OF NORTH CANAAN, UTILITY PROVIDERS AND GOVERNING AUTHORITIES.

GENERAL LEGEND

	EXISTING	PROPOSED
PROPERTY LINE		
BUILDING SETBACK		
SOLAR SETBACK		
EASEMENT		
TREE LINE		
WETLAND		
WETLAND BUFFER		
VERNAL POOL		
VERNAL POOL BUFFER		
WATERCOURSE		
WATERCOURSE BUFFER		
MAJOR CONTOUR		
MINOR CONTOUR		
UNDERGROUND ELECTRIC		E E
OVERHEAD ELECTRIC		OH OH
GAS LINE		
WATER LINE		W W
BASIN		
SWALE		
FENCE		X X X
LIMIT OF DISTURBANCE		LOD
LIMIT OF CLEARING AND GRUBBING		LCG
FILTER SOCK		FS FS
SILT FENCE		SF SF
BAFFLE		

LSE INDUS LLC
40 TOWER LANE, SUITE 201
AVON, CT 06001

ALL-POINTS TECHNOLOGY CORPORATION
567 VAUXHALL STREET EXTENSION - SUITE 311
WATERFORD, CT 06385 PHONE: (860)-663-1697
WWW.ALLPOINTSTECH.COM FAX: (860)-663-0935

CSC PERMIT SET

NO	DATE	REVISION
0	10/19/21	FOR REVIEW: KAM
1		
2		
3		
4		
5		
6		

DESIGN PROFESSIONAL OF RECORD

PROF: KEVIN A. MCCAFFERY, P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION, P.C.
ADD: 567 VAUXHALL STREET EXTENSION - SUITE 311 WATERFORD, CT 06385

OWNER: JOHN BUNCE

ADDRESS: 81 EAST MAIN ST NORTH CANAAN, CT

BUNCE 1 SOLAR FACILITY

SITE ADDRESS: 81 EAST MAIN ST NORTH CANAAN, CT

APT FILING NUMBER: CT606140

DRAWN BY: JT

DATE: 10/19/21 CHECKED BY: KAM

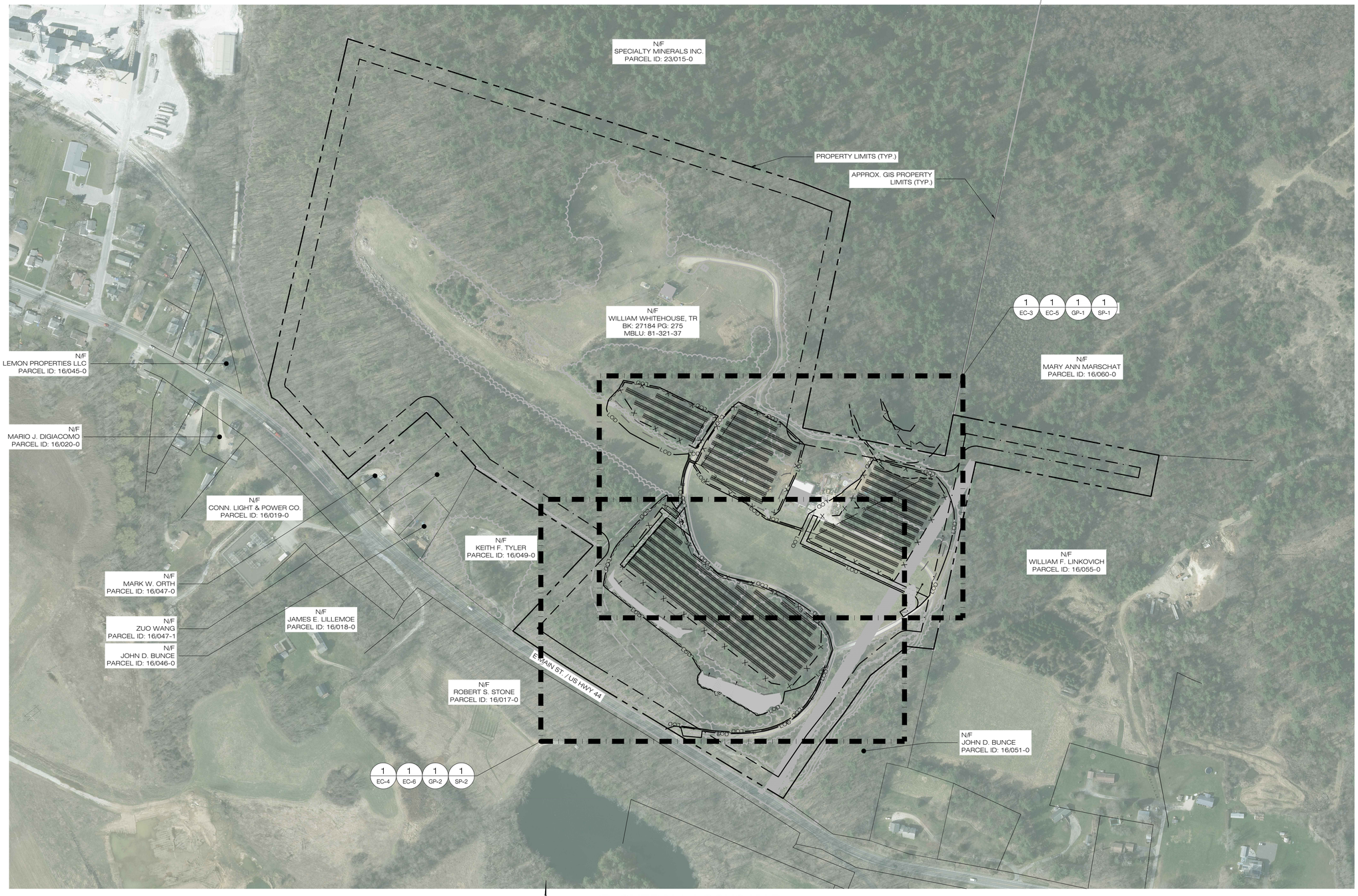
SHEET TITLE:

GENERAL NOTES

SHEET NUMBER:

GN-1

STATE OF CONNECTICUT · KEVIN A. MCCAFFERY · 25977 · LICENSED PROFESSIONAL ENGINEER



1 OP-1 **OVERALL LOCUS MAP**
SCALE : 1" = 150'-0"

LSE INDUS LLC
40 TOWER LANE, SUITE 201
AVON, CT 06001

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SHEET TITLE:

OVERALL LOCUS MAP

SHEET NUMBER:

OP-1

STATE OF CONNECTICUT KEVIN A. MCCAFFERY 21977 LICENSED PROFESSIONAL ENGINEER

EROSION CONTROL NOTES

EROSION AND SEDIMENT CONTROL PLAN NOTES

1. THE CONTRACTOR SHALL CONSTRUCT ALL SEDIMENT AND EROSION CONTROLS IN ACCORDANCE WITH THE 2002 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL, LATEST EDITION, IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, AND AS DIRECTED BY THE TOWN OF NORTH CANAAN, PERMITTEE, AND/OR SWPCP MONITOR. ALL PERIMETER SEDIMENTATION AND EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE START OF CLEARING AND GRUBBING AND DEMOLITION OPERATIONS.

2. THESE DRAWINGS ARE ONLY INTENDED TO DESCRIBE THE SEDIMENT AND EROSION CONTROL MEASURES FOR THIS SITE. SEE CONSTRUCTION SEQUENCE FOR ADDITIONAL INFORMATION. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHOWN ON THE EROSION & SEDIMENT CONTROL PLAN ARE SHOWN AS REQUIRED BY THE ENGINEER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT ALL EROSION CONTROL MEASURES ARE CONFIGURED AND CONSTRUCTED IN A MANNER THAT WILL MINIMIZE EROSION OF SOILS AND PREVENT THE TRANSPORT OF SEDIMENTS AND OTHER POLLUTANTS TO STORM DRAINAGE SYSTEMS AND/OR WATERCOURSES. ACTUAL SITE CONDITIONS OR SEASONAL AND CLIMATIC CONDITIONS MAY WARRANT ADDITIONAL CONTROLS OR CONFIGURATIONS, AS REQUIRED, AND AS DIRECTED BY THE PERMITTEE AND/OR SWPCP MONITOR. REFER TO SITE PLAN FOR GENERAL INFORMATION AND OTHER CONTRACT PLANS FOR APPROPRIATE INFORMATION.

3. A BOND OR LETTER OF CREDIT MAY BE REQUIRED TO BE POSTED WITH THE GOVERNING AUTHORITY FOR THE EROSION CONTROL INSTALLATION AND MAINTENANCE.

4. THE CONTRACTOR SHALL APPLY THE MINIMUM EROSION & SEDIMENT CONTROL MEASURES SHOWN ON THE PLAN IN CONJUNCTION WITH CONSTRUCTION SEQUENCING, SUCH THAT ALL ACTIVE WORK ZONES ARE PROTECTED. ADDITIONAL AND/OR ALTERNATIVE SEDIMENT AND EROSION CONTROL MEASURES MAY BE INSTALLED DURING THE CONSTRUCTION PERIOD IF FOUND NECESSARY BY THE CONTRACTOR, OWNER, SITE ENGINEER, MUNICIPAL OFFICIALS, OR ANY GOVERNING AGENCY. THE CONTRACTOR SHALL CONTACT THE OWNER AND APPROPRIATE GOVERNING AGENCIES FOR APPROVAL IF ALTERNATIVE CONTROLS OTHER THAN THOSE SHOWN ON THE PLANS ARE PROPOSED BY THE CONTRACTOR.

5. THE CONTRACTOR SHALL TAKE EXTREME CARE DURING CONSTRUCTION SO AS NOT TO DISTURB UNPROTECTED WETLAND AREAS OR INSTALLED SEDIMENTATION AND EROSION CONTROL MEASURES. THE CONTRACTOR SHALL INSPECT ALL SEDIMENT AND EROSION CONTROLS WEEKLY AND WITHIN 24 HOURS OF A STORM WITH A RAINFALL AMOUNT OF 0.25 INCHES OR GREATER TO VERIFY THAT THE CONTROLS ARE OPERATING PROPERLY AND MAKE REPAIRS AS NECESSARY IN A TIMELY MANOR.

6. THE CONTRACTOR SHALL KEEP A SUPPLY OF EROSION CONTROL MATERIAL (SILT FENCE, COMPOST FILTER SOCK, EROSION CONTROL BLANKET, ETC.) ON-SITE FOR PERIODIC MAINTENANCE AND EMERGENCY REPAIRS.

7. ALL FILL MATERIAL PLACED ADJACENT TO ANY WETLAND AREA SHALL BE GOOD QUALITY, WITH LESS THAN 5% FINES PASSING THROUGH A #200 SIEVE (BANK RUN), SHALL BE PLACED IN MAXIMUM ONE FOOT LIFTS, AND SHALL BE COMPACTED TO 95% MAX. DRY DENSITY MODIFIED PROCTOR OR AS SPECIFIED IN THE CONTRACT SPECIFICATIONS.

8. PROTECT EXISTING TREES THAT ARE TO BE SAVED BY FENCING, ORANGE SAFETY FENCE, CONSTRUCTION TAPE, OR EQUIVALENT FENCING/TAPE. ANY LIMB TRIMMING SHOULD BE DONE AFTER CONSULTATION WITH AN ARBORIST AND BEFORE CONSTRUCTION BEGINS IN THAT AREA; FENCING SHALL BE MAINTAINED AND REPAIRED DURING CONSTRUCTION.

9. CONSTRUCTION ENTRANCES (ANTI-TRACKING PADS) SHALL BE INSTALLED PRIOR TO ANY SITE EXCAVATION OR CONSTRUCTION ACTIVITY AND SHALL BE MAINTAINED THROUGHOUT THE DURATION OF ALL CONSTRUCTION IF REQUIRED. THE LOCATION OF THE TRACKING PADS MAY CHANGE AS VARIOUS PHASES OF CONSTRUCTION ARE COMPLETED. CONTRACTOR SHALL ENSURE THAT ALL VEHICLES EXITING THE SITE ARE PASSING OVER THE ANTI-TRACKING PADS PRIOR TO EXITING.

10. ALL CONSTRUCTION SHALL BE CONTAINED WITHIN THE LIMIT OF DISTURBANCE, WHICH SHALL BE MARKED WITH SILT FENCE, SAFETY FENCE, HAY BALES, RIBBONS, OR OTHER MEANS PRIOR TO CLEARING. CONSTRUCTION ACTIVITY SHALL REMAIN ON THE UPHILL SIDE OF THE SEDIMENT BARRIER UNLESS WORK IS SPECIFICALLY CALLED FOR ON THE DOWNHILL SIDE OF THE BARRIER.

11. NO CUT OR FILL SLOPES SHALL EXCEED 2:1 EXCEPT WHERE STABILIZED BY ROCK FACED EMBANKMENTS OR EROSION CONTROL BLANKETS. ALL SLOPES SHALL BE SEEDED AND BANKS WILL BE STABILIZED IMMEDIATELY UPON COMPLETION OF FINAL GRADING UNTIL TURF IS ESTABLISHED.

12. DIRECT ALL DEWATERING PUMP DISCHARGE TO A SEDIMENT CONTROL DEVICE CONFORMING TO THE GUIDELINES WITHIN THE APPROVED LIMIT OF DISTURBANCE IF REQUIRED. DISCHARGE TO STORM DRAINS OR SURFACE WATERS FROM SEDIMENT CONTROLS SHALL BE CLEAR AND APPROVED BY THE PERMITTEE OR MUNICIPALITY.

13. THE CONTRACTOR SHALL MAINTAIN A CLEAN CONSTRUCTION SITE AND SHALL NOT ALLOW THE ACCUMULATION OF RUBBISH OR CONSTRUCTION DEBRIS ON THE SITE. PROPER SANITARY DEVICES SHALL BE MAINTAINED ON-SITE AT ALL TIMES AND SECURED APPROPRIATELY. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID THE SPILLAGE OF FUEL OR OTHER POLLUTANTS ON THE CONSTRUCTION SITE AND SHALL ADHERE TO ALL APPLICABLE POLICIES AND REGULATIONS RELATED TO SPILL PREVENTION AND RESPONSE/CONTAINMENT.

14. MINIMIZE LAND DISTURBANCES. SEED AND MULCH DISTURBED AREAS WITH TEMPORARY MIX AS SOON AS PRACTICABLE (2 WEEK MAXIMUM UNSTABILIZED PERIOD) USING PERENNIAL RYEGRASS AT 40 LBS PER ACRE. MULCH ALL CUT AND FILL SLOPES AND SWALES WITH LOOSE HAY AT A RATE OF 2 TONS PER ACRE. IF NECESSARY, REPLACE LOOSE HAY ON SLOPES WITH EROSION CONTROL BLANKETS OR JUTE CLOTH. MODERATELY GRADED AREAS, ISLANDS, AND TEMPORARY CONSTRUCTION STAGING AREAS MAY BE HYDROSEEDED WITH TACKIFIER.

15. SWEEP AFFECTED PORTIONS OF OFF SITE ROADS ONE OR MORE TIMES A DAY (OR LESS FREQUENTLY IF TRACKING IS NOT A PROBLEM) DURING CONSTRUCTION. FOR DUST CONTROL, PERIODICALLY MOISTEN EXPOSED SOIL SURFACES WITH WATER ON UNPAVED TRAVELWAYS TO KEEP THE TRAVELWAYS DAMP. CALCIUM CHLORIDE MAY ALSO BE APPLIED TO ACCESS ROADS. DUMP TRUCK LOADS EXITING THE SITE SHALL BE COVERED.

16. VEGETATIVE ESTABLISHMENT SHALL OCCUR ON ALL DISTURBED SOIL, UNLESS THE AREA IS UNDER ACTIVE CONSTRUCTION, IT IS COVERED IN STONE OR SCHEDULED FOR PAVING WITHIN 30 DAYS. TEMPORARY SEEDING OR NON-LIVING SOIL PROTECTION OF ALL EXPOSED SOILS AND SLOPES SHALL BE INITIATED WITHIN THE FIRST 7 DAYS OF SUSPENDING WORK IN AREAS TO BE LEFT LONGER THAN 30 DAYS.

17. MAINTAIN ALL PERMANENT AND TEMPORARY SEDIMENT CONTROL DEVICES IN EFFECTIVE CONDITION THROUGHOUT THE CONSTRUCTION PERIOD. UPON COMPLETION OF WORK SWEEP CONCRETE PADS, CLEAN THE STORMWATER MANAGEMENT SYSTEMS AND REMOVE ALL TEMPORARY SEDIMENT CONTROLS ONCE THE SITE IS FULLY STABILIZED AND APPROVAL HAS BEEN RECEIVED FROM PERMITTEE OR THE MUNICIPALITY.

18. THE SITE WAS DESIGNED TO COMPLY WITH FEDERAL, STATE, AND, IF APPLICABLE, LOCAL STANDARDS, PLUS CURRENT ACCEPTED PRACTICES FOR THE INDUSTRY. ADDITIONAL CONTROLS AND ACTIVITIES MAY BE DEEMED NECESSARY BY THE SWPCP MONITOR DURING CONSTRUCTION AS A RESULT OF UNFORESEEN CONDITIONS AND/OR MEANS AND METHODS. SUCH ITEMS MAY INCLUDE, BUT ARE NOT LIMITED TO: ADDITIONAL FOREBAYS, BASINS, OR UPSTREAM STRUCTURAL CONTROLS, THE USE OF FLOCCULANTS OF FLOCK LOGS TO DECREASE SEDIMENT, DISCHARGE MANAGEMENT SUCH AS ADDITIONAL ARMORING AND FILTERING MEASURES (I.E. STRAW BALES, WATTLES, ETC.), AND HYDROSEEDING WITH RAPIDLY GERMINATING SEED.

19. SEEDING MIXTURES SHALL BE ERNST SOLAR FARM SEED MIX (ERNMX-186) (SEE SITE DETAILS SHEET DN-1), OR APPROVED EQUAL BY OWNER.

CONSTRUCTION OPERATION AND MAINTENANCE PLAN - BY CONTRACTOR

E&S MEASURE	INSPECTION SCHEDULE	MAINTENANCE REQUIRED
CONSTRUCTION ENTRANCE	DAILY	PLACE ADDITIONAL STONE, EXTEND THE LENGTH OR REMOVE AND REPLACE THE STONE. CLEAN PAVED SURFACES OF TRACKED SEDIMENT.
COMPOST FILTER SOCK	WEEKLY & WITHIN 24 HOURS OF RAINFALL > 0.25"	REPAIR/REPLACE WHEN FAILURE OR DETERIORATION IS OBSERVED.
SILT FENCE	WEEKLY & WITHIN 24 HOURS OF RAINFALL > 0.25"	REPAIR/REPLACE WHEN FAILURE OR DETERIORATION IS OBSERVED. REMOVE SILT WHEN IT REACHES 1/2 THE HEIGHT OF THE FENCE.
TOPSOIL/BORROW STOCKPILES	DAILY	REPAIR/REPLACE SEDIMENT BARRIERS AS NECESSARY.
TEMPORARY SEDIMENT BASIN (W/ BAFFLES)	WEEKLY & WITHIN 24 HOURS OF RAINFALL > 0.5"	REMOVE SEDIMENT ONCE IT HAS ACCUMULATED TO ONE HALF OF MINIMUM REQUIRED VOLUME OF THE WET STORAGE, DEWATERING AS NEEDED. RESTORE TRAP TO ORIGINAL DIMENSIONS. REPAIR/REPLACE BAFFLES WHEN FAILURE OR DETERIORATION IS OBSERVED.
TEMPORARY SEDIMENT TRAP (W/ BAFFLES)	WEEKLY & WITHIN 24 HOURS OF RAINFALL > 0.5"	REMOVE SEDIMENT ONCE IT HAS ACCUMULATED TO ONE HALF OF MINIMUM REQUIRED VOLUME OF THE WET STORAGE, DEWATERING AS NEEDED. RESTORE TRAP TO ORIGINAL DIMENSIONS. REPAIR/REPLACE BAFFLES WHEN FAILURE OR DETERIORATION IS OBSERVED.
TEMPORARY SOIL PROTECTION	WEEKLY & WITHIN 24 HOURS OF RAINFALL > 0.25"	REPAIR ERODED OR BARE AREAS IMMEDIATELY. RESEED AND MULCH.

SEDIMENT & EROSION CONTROL NARRATIVE

1. THE PROJECT INVOLVES THE CONSTRUCTION OF A GROUND MOUNTED SOLAR PANEL FACILITY WITH ASSOCIATED EQUIPMENT, INCLUDING THE CLEARING, GRUBBING AND GRADING OF APPROXIMATELY 11.62± ACRES OF EXISTING LOT.

THE PROPOSED PROJECT INVOLVES THE FOLLOWING CONSTRUCTION:

A. CLEARING, GRUBBING, AND GRADING OF EXISTING LOT.
B. CONSTRUCTION OF 5,902 GROUND MOUNTED SOLAR PANELS AND ASSOCIATED EQUIPMENT.
B. THE STABILIZATION OF DISTURBED AREAS WITH PERMANENT VEGETATIVE TREATMENTS.

2. FOR THIS PROJECT, THERE ARE APPROXIMATELY 11.62± ACRE OF THE SITE BEING DISTURBED WITH NEGLIGIBLE INCREASE IN THE IMPERVIOUS AREA OF THE SITE, AS ALL ACCESS THOUGH THE SITE WILL BE GRAVEL. IMPERVIOUS AREAS ARE LIMITED TO THE CONCRETE PADS FOR ELECTRICAL EQUIPMENT.

3. THE PROJECT SITE, AS MAPPED IN THE SOIL SURVEY OF STATE OF CONNECTICUT (NRCS, VERSION 20, JUN 9, 2020), CONTAINS TYPE 61B, 73C, 90B, AND 90D (HYDROLOGIC SOIL GROUP B), AND 49B (HYDROLOGIC SOIL GROUP C). A GEOTECHNICAL ENGINEERING REPORT HAS NOT BEEN COMPLETED.

4. IT IS ANTICIPATED THAT CONSTRUCTION WILL BE COMPLETED IN APPROXIMATELY 3-4 MONTHS.

5. REFER TO THE CONSTRUCTION SEQUENCING AND EROSION AND SEDIMENTATION NOTES FOR INFORMATION REGARDING SEQUENCING OF MAJOR OPERATIONS IN THE ON-SITE CONSTRUCTION PHASES.

6. STORMWATER MANAGEMENT DESIGN CRITERIA UTILIZES THE APPLICABLE SECTIONS OF THE 2004 CONNECTICUT STORMWATER QUALITY MANUAL AND THE TOWN OF NORTH CANAAN STANDARDS, TO THE EXTENT POSSIBLE AND PRACTICABLE FOR THIS PROJECT ON THIS SITE. EROSION AND SEDIMENTATION MEASURES ARE BASED UPON ENGINEERING PRACTICE, JUDGEMENT AND THE APPLICABLE SECTIONS OF THE CONNECTICUT EROSION AND SEDIMENT CONTROL GUIDELINES FOR URBAN AND SUBURBAN AREAS, LATEST EDITION.

7. DETAILS FOR THE TYPICAL STORMWATER MANAGEMENT AND EROSION AND SEDIMENTATION MEASURES ARE SHOWN ON THE PLAN SHEETS OR PROVIDED AS SEPARATE SUPPORT DOCUMENTATION FOR REVIEW IN THIS PLAN.

8. CONSERVATION PRACTICES TO BE USED DURING CONSTRUCTION:
   A. STAGED CONSTRUCTION;
   B. MINIMIZE THE DISTURBED AREAS TO THE EXTENT PRACTICABLE DURING CONSTRUCTION;
   C. STABILIZE DISTURBED AREAS WITH TEMPORARY OR PERMANENT MEASURES AS SOON AS POSSIBLE, BUT NO LATER THAN 7-DAYS FOLLOWING DISTURBANCE;
   D. MINIMIZE IMPERVIOUS AREAS;
   E. UTILIZE APPROPRIATE CONSTRUCTION EROSION AND SEDIMENTATION MEASURES.

9. THE FOLLOWING SEPARATE DOCUMENTS ARE TO BE CONSIDERED A PART OF THE EROSION AND SEDIMENTATION PLAN:
   A. STORMWATER MANAGEMENT REPORT DATED OCTOBER 2021.
   B. SWPCP DATED OCTOBER 2021.

SUGGESTED CONSTRUCTION SEQUENCE

THE FOLLOWING SUGGESTED SEQUENCE OF CONSTRUCTION ACTIVITIES IS PROJECTED BASED UPON ENGINEERING JUDGEMENT AND BEST MANAGEMENT PRACTICES. THE CONTRACTOR MAY ELECT TO ALTER THE SEQUENCING TO BEST MEET THE CONSTRUCTION SCHEDULE, THE EXISTING SITE ACTIVITIES AND WEATHER CONDITIONS. SHOULD THE CONTRACTOR ALTER THE CONSTRUCTION SEQUENCE OR ANY EROSION AND SEDIMENTATION CONTROL MEASURES THEY SHALL MODIFY THE STORMWATER POLLUTION CONTROL PLAN ("SWPCP") AS REQUIRED BY THE GENERAL PERMIT. MAJOR CHANGES IN SEQUENCING AND/OR METHODS MAY REQUIRE REGULATORY APPROVAL PRIOR TO IMPLEMENTATION.

1. THE CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION MEETING. PHYSICALLY FLAG THE LIMITS OF DISTURBANCE IN THE FIELD AS NECESSARY TO FACILITATE THE PRE-CONSTRUCTION MEETING.

2. CONDUCT A PRE-CONSTRUCTION MEETING TO DISCUSS THE PROPOSED WORK AND EROSION AND SEDIMENTATION CONTROL MEASURES. THE MEETING SHOULD BE ATTENDED BY THE OWNER, THE OWNER'S REPRESENTATIVE(S), THE GENERAL CONTRACTOR, DESIGNATED SUB-CONTRACTORS AND THE PERSON, OR PERSONS, RESPONSIBLE FOR THE IMPLEMENTATION, OPERATION, MONITORING AND MAINTENANCE OF THE EROSION AND SEDIMENTATION MEASURES. THE CONSTRUCTION PROCEDURES FOR THE ENTIRE PROJECT SHALL BE REVIEWED AT THIS MEETING.

3. NOTIFY CALL BEFORE YOU DIG AT 811, AS REQUIRED, PRIOR TO THE START OF CONSTRUCTION.

PHASE 1

4. REMOVE EXISTING IMPEDIMENTS AS NECESSARY AND PROVIDE MINIMAL CLEARING AND GRUBBING TO INSTALL THE REQUIRED CONSTRUCTION ENTRANCE/S.

5. CLEAR ONLY AS NEEDED TO INSTALL THE PERIMETER EROSION AND SEDIMENTATION CONTROL MEASURES AND, IF APPLICABLE, TREE PROTECTION. ALL WETLAND AREAS SHALL BE PROTECTED BEFORE MAJOR CONSTRUCTION BEGINS.

6. INSTALL PERIMETER EROSION CONTROL.

7. INSTALL TEMPORARY SEDIMENT TRAPS (TST-1A, TST-1B). UPON COMPLETION OF THE INSTALLATION AND STABILIZATION OF THE BASIN AND SWALES, PHASE 2 WORK UP GRADIENT CAN PROCEED.

8. INSTALL PERMANENT BASIN 3 (B-3).

PHASE 2

9. UPON COMPLETION OF THE INSTALLATION OF EACH OF THE TEMPORARY SEDIMENT BASINS AND REQUIRED PERIMETER CONTROLS, THE AREAS UPSTREAM CAN HAVE THE REMAINING ARRAY AREA CLEARING AND GRUBBING COMPLETED AS REQUIRED. REMOVE CUT WOOD AND STOCKPILE FOR FUTURE USE OR REMOVE OFF-SITE. REMOVE AND DISPOSE OF DEMOLITION DEBRIS OFF-SITE IN ACCORDANCE WITH APPLICABLE LAWS.

10. TEMPORARILY SEED DISTURBED AREAS NOT UNDER CONSTRUCTION FOR THIRTY (30) DAYS OR MORE.

11. INSTALL CONCRETE EQUIPMENT PADS.

12. INSTALL ELECTRICAL CONDUITS.

13. INSTALL RACKING POSTS FOR GROUND MOUNTED SOLAR PANELS.

14. INSTALL GROUND MOUNTED SOLAR PANELS AND COMPLETE ELECTRICAL INSTALLATION.

15. AFTER SUBSTANTIAL COMPLETION OF THE INSTALLATION OF THE SOLAR PANELS, COMPLETE REMAINING SITE WORK, INCLUDING ANY REQUIRED LANDSCAPE SCREENING, AND STABILIZE ALL DISTURBED AREAS.

16. FINE GRADE, RAKE, SEED AND MULCH ALL REMAINING DISTURBED AREAS.

17. AFTER THE SITE IS DEEMED TO HAVE ACHIEVED FINAL STABILIZATION AND WITH THE APPROVAL OF THE PERMITTEE, REMOVE PERIMETER EROSION AND SEDIMENTATION CONTROLS AND CLEAN AND CONVERT TEMPORARY SEDIMENT BASIN TO PERMANENT STORMWATER WATER QUALITY VOLUME BASIN. ANY AREAS DISTURBED DURING CLEAN UP SHALL BE PERMANENTLY SEEDED.

18. THE SITE SHALL BE MONITORED ONCE A MONTH FOR TWO FULL GROWING SEASONS (APRIL - OCTOBER).

19. ISSUE NOTICE OF TERMINATION UPON COMPLETION OF MONITORING REQUIRED PER APPENDIX I.

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DESIGN PROFESSIONAL OF RECORD

PROF: KEVIN A. MCCAFFERY, P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION, P.C.
ADD: 567 VAUXHALL STREET EXTENSION - SUITE 311 WATERFORD, CT 06385

OWNER: JOHN BUNCE

ADDRESS: 81 EAST MAIN ST NORTH CANAAN, CT

BUNCE 1 SOLAR FACILITY

SITE ADDRESS: 81 EAST MAIN ST NORTH CANAAN, CT

APT FILING NUMBER: CT606140

DRAWN BY: JT

DATE: 10/19/21 CHECKED BY: KAM

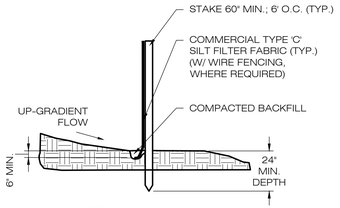
SHEET TITLE:

SEDIMENTATION & EROSION CONTROL NOTES

SHEET NUMBER:

EC-1

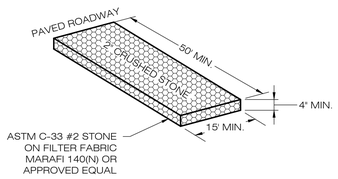
STATE OF CONNECTICUT · KEVIN A. MCCAFFERY · 25971 · LICENSED PROFESSIONAL ENGINEER



NOTE:
SILT FENCE SHALL BE LAPPED ONLY WHEN NECESSARY PER THE MANUFACTURER RECOMMENDATIONS.

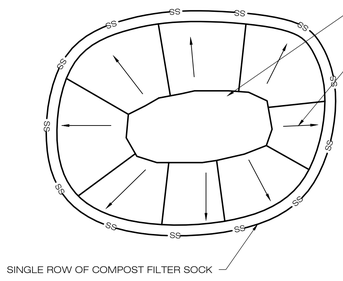
1 EC-2 SILT FENCE DETAIL

SCALE : N.T.S.



2 EC-2 CONSTRUCTION ENTRANCE DETAIL

SCALE : N.T.S.



NOTES:
1. ALL EXISTING EXCAVATED MATERIAL THAT IS NOT TO BE REUSED IN THE WORK IS TO BE IMMEDIATELY REMOVED FROM THE SITE AND PROPERLY DISPOSED OF.

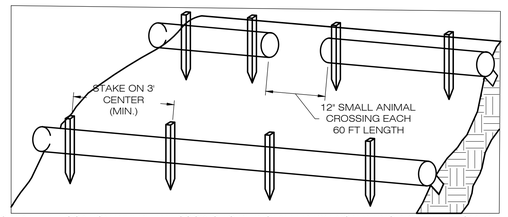
2. SOIL/AGGREGATE STOCKPILE SITES TO BE WHERE SHOWN ON THE DRAWINGS.

3. RESTORE STOCKPILE SITES TO PRE-EXISTING PROJECT CONDITION AND RESEED AS REQUIRED.

4. STOCKPILE HEIGHTS MUST NOT EXCEED 35'. STOCKPILE SLOPES MUST BE 2:1 OR FLATTER.

3 EC-2 MATERIALS STOCKPILE DETAIL

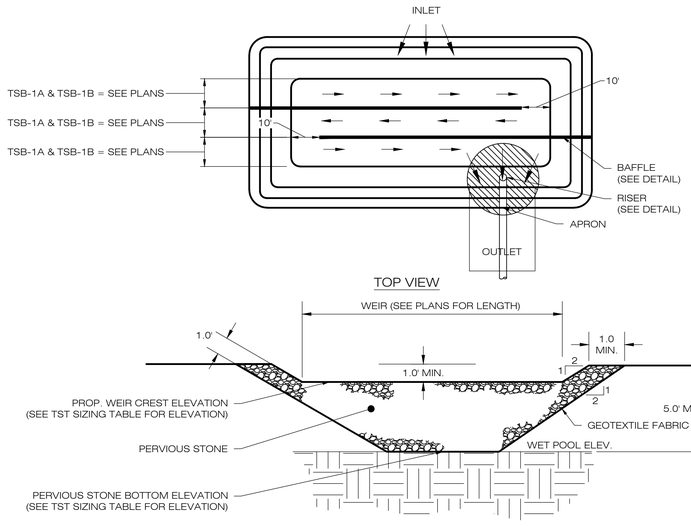
SCALE : N.T.S.



1. BEGIN AT THE LOCATION WHERE THE SOCK IS TO BE INSTALLED BY EXCAVATING A 2-3" (5-7.5 CM) DEEP X 9" (22.9 CM) WIDE TRENCH ALONG THE CONTOUR OF THE SLOPE. EXCAVATED SOIL SHOULD BE PLACED UP SLOPE FROM THE ANCHOR TRENCH.
2. PLACE THE SOCK IN THE TRENCH SO THAT IT CONTOURS TO THE SOIL SURFACE. COMPACT SOIL FROM THE EXCAVATED TRENCH AGAINST THE SOCK ON THE UPHILL SIDE. SOCKS SHALL BE INSTALLED IN 60 FT CONTINUOUS LENGTHS WITH ADJACENT SOCKS TIGHTLY ABUT. EVERY 60 FT THE SOCK ROW SHALL BE SPACED 12 INCHES CLEAR, END TO END, FOR AMPHIBIAN AND REPTILE TRAVEL. THE OPEN SPACES SHALL BE STAGGERED MID LENGTH OF THE NEXT DOWN GRADIENT SOCK.
3. SECURE THE SOCK WITH 18-24" (45.7-61 CM) STAKES EVERY 3-4' (0.9 -1.2 M) AND WITH A STAKE ON EACH END. STAKES SHOULD BE DRIVEN THROUGH THE MIDDLE OF THE SOCK LEAVING AT LEAST 2-3" (5-7.5 CM) OF STAKE EXTENDING ABOVE THE SOCK. STAKES SHOULD BE DRIVEN PERPENDICULAR TO THE SLOPE FACE.

4 EC-2 COMPOST FILTER SOCK SEDIMENTATION CONTROL BARRIER

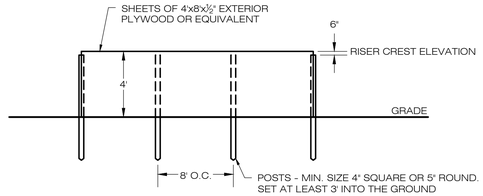
SCALE : N.T.S.



NOTES:
1. CONSTRUCT TEMPORARY SEDIMENT TRAP BERMS AND SIDEWALLS PER THE INFILTRATION BASIN DETAIL.
2. PERVIOUS STONE DIKE SHALL BE CONSTRUCTED OF CT DOT MODIFIED RIP-RAP WITH #3 STONE ON FACE.
3. SEDIMENT TRAP BAFFLES SHALL BE INSTALLED AS SHOWN ON EC-1 AND EC-2.
4. SEE TST SIZING TABLE FOR WET AND DRY STORAGE VOLUMES.

5 EC-2 TEMPORARY SEDIMENT TRAP

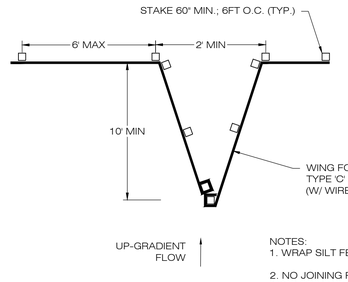
SCALE : N.T.S.



NOTES:
1. FILL ANY VOIDS BETWEEN THE BOTTOM OF THE BASIN AND BAFFLE.

6 EC-2 SEDIMENT TRAP BAFFLE

SCALE : N.T.S.



NOTES:
1. WRAP SILT FENCE AT ENDS.

2. NO JOINING FENCE SECTIONS SHALL BE INSTALLED WITHIN 30 FEET OF WING.

7 EC-2 SILT FENCE WING DETAIL

SCALE : N.T.S.

TEMPORARY SEDIMENT BASIN SIZING TABLE

NAME	DRAINAGE AREA (AC)	SEDIMENT VOLUME/ACRE AREA (CY)	REQ. VOLUME (CY)	REQ. WET VOLUME (CY)	PROP. BTM. ELEV. (FT)	PROP. STONE DIKE BTM. ELEV. (FT)	PROP. WEIR CREST ELEV. (FT)	PROP. TOP ELEV. (FT)	WET VOL. PROVIDED (CY)	TOTAL VOL. PROVIDED. (CY)
TSB-1A	1.74 AC	134 CYD	233 CY	117 CYD	813.0'	815.0'	816.0'	817.0'	230 CY	421 CY
TSB-1B	1.70 AC	134 CYD	228 CY	114 CYD	836.0'	838.0'	839.0'	840.0'	280 CY	510 CY

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APT FILING NUMBER: CT606140

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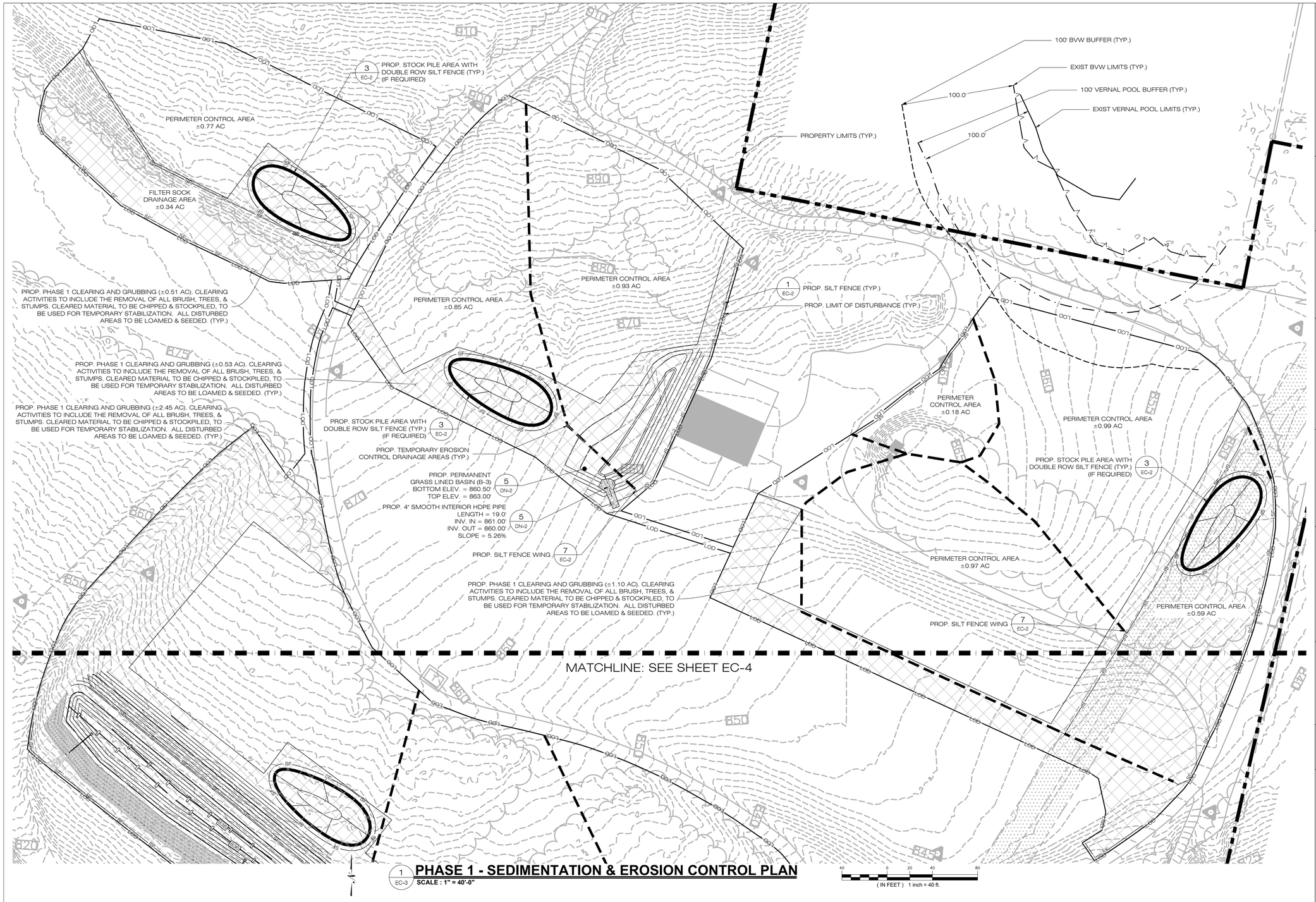
DATE: 10/19/21 **CHECKED BY:** KAM

SHEET TITLE:
SEDIMENTATION & EROSION CONTROL DETAILS

SHEET NUMBER:
EC-2



1 EC-3 PHASE 1 - SEDIMENTATION & EROSION CONTROL PLAN

SCALE : 1" = 40'-0"

40 0 20 40 80

(IN FEET) 1 inch = 40 ft.

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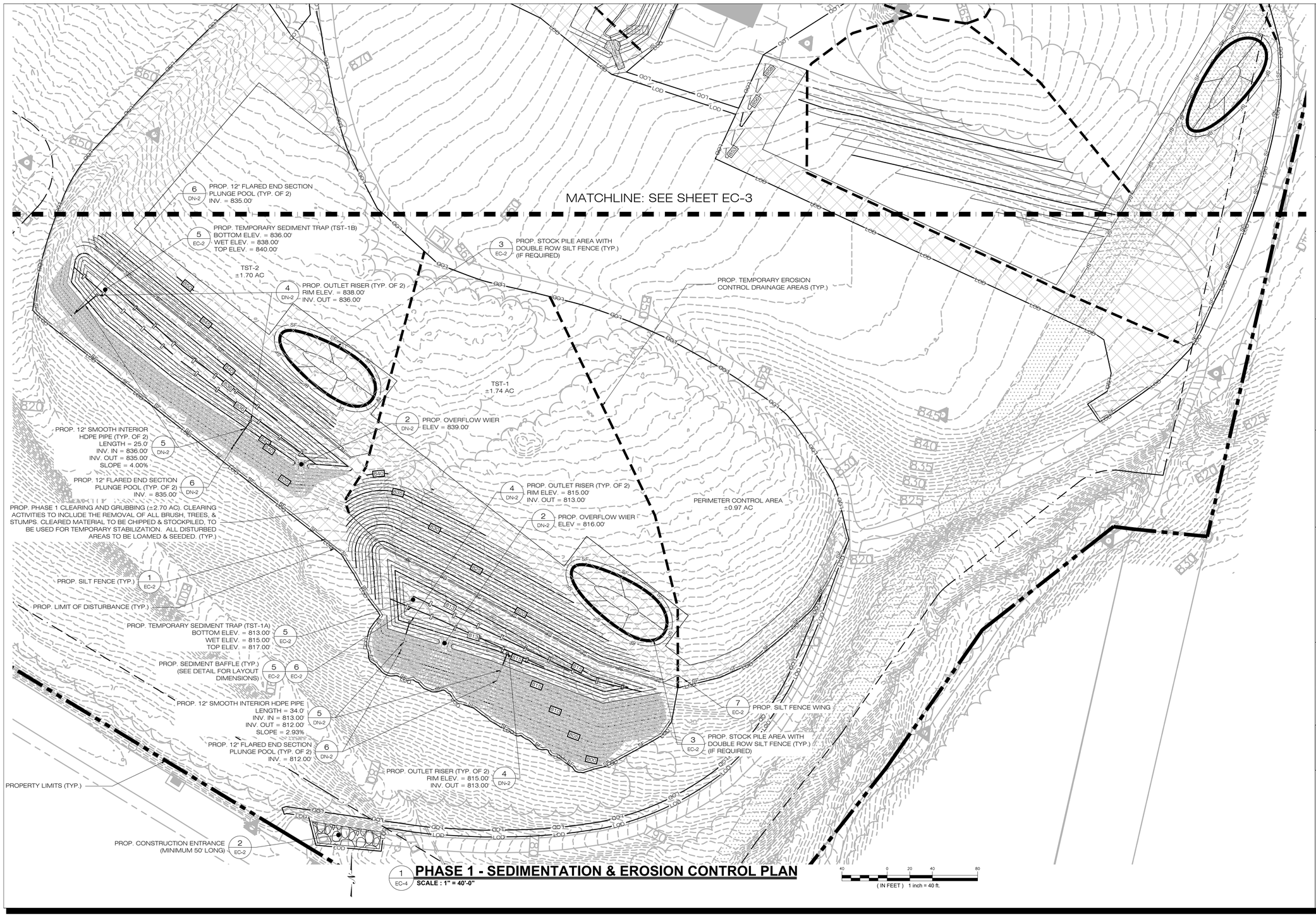
SHEET TITLE:

PHASE 1 SEDIMENTATION & EROSION CONTROL PLAN

SHEET NUMBER:

EC-3

STATE OF CONNECTICUT KEVIN A. MCCAFFERY 25977 LICENSED PROFESSIONAL ENGINEER



1 EC-4 PHASE 1 - SEDIMENTATION & EROSION CONTROL PLAN

SCALE : 1" = 40'-0"

40 0 20 40 80

(IN FEET) 1 inch = 40 ft.

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BUNCE 1 SOLAR FACILITY

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DRAWN BY: JT

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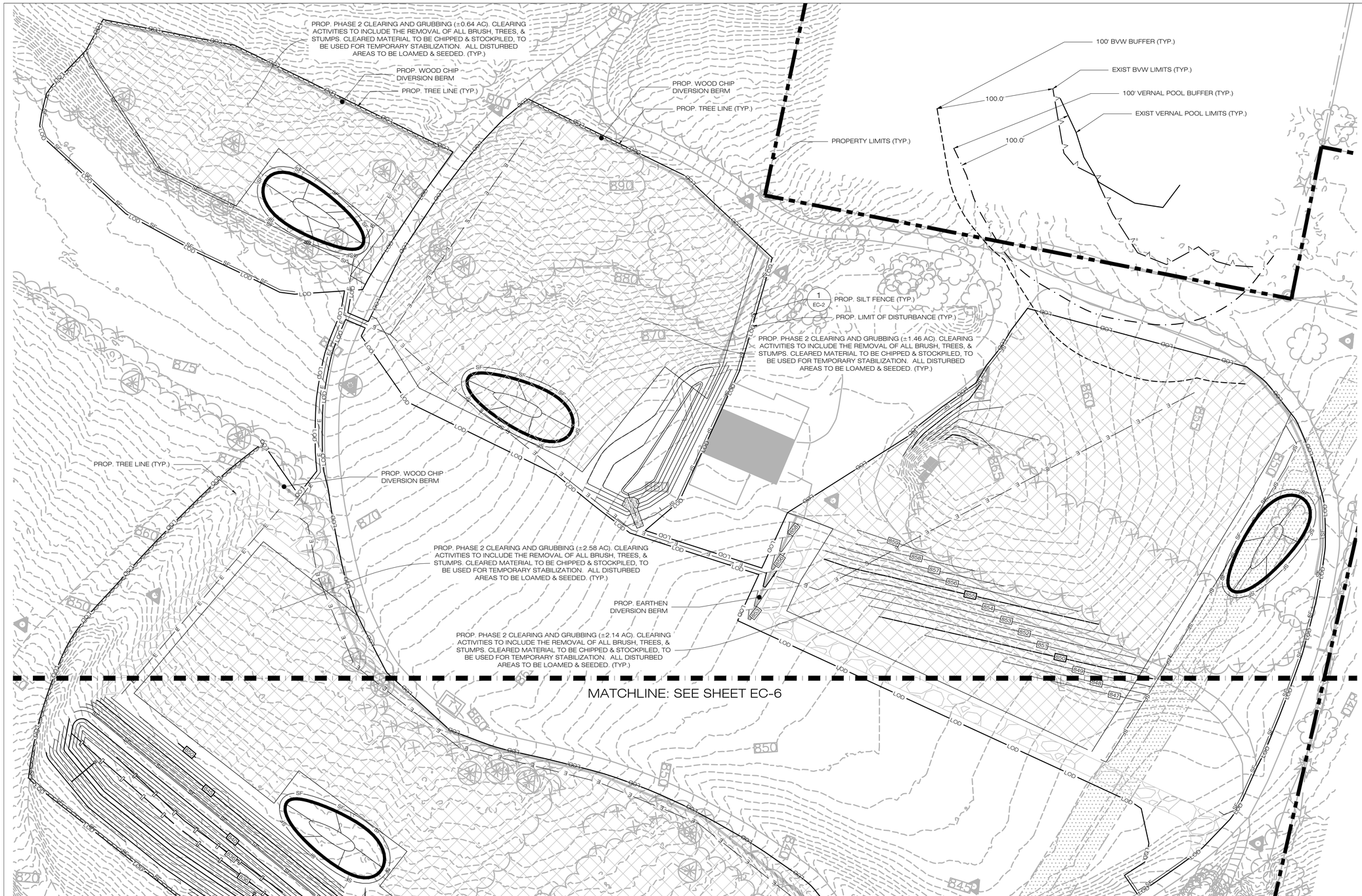
SHEET TITLE:

PHASE 1 SEDIMENTATION & EROSION CONTROL PLAN

SHEET NUMBER:

EC-4

STATE OF CONNECTICUT KEVIN A. MCCAFFERY 25977 REGISTERED PROFESSIONAL ENGINEER



1 EC-5 **PHASE 2 - SEDIMENTATION & EROSION CONTROL PLAN**

SCALE : 1" = 40'-0"

40 0 20 40 80

(IN FEET) 1 inch = 40 ft.

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DRAWN BY: JT

DATE: 10/19/21 CHECKED BY: KAM

SHEET TITLE:

PHASE 2 SEDIMENTATION & EROSION CONTROL PLAN

SHEET NUMBER:

EC-5

STATE OF CONNECTICUT KEVIN A. MCCAFFERY 25971 LICENSED PROFESSIONAL ENGINEER

MATCHLINE: SEE SHEET EC-5

PROP. PHASE 2 CLEARING AND GRUBBING (±2.58 AC). CLEARING ACTIVITIES TO INCLUDE THE REMOVAL OF ALL BRUSH, TREES, & STUMPS. CLEARED MATERIAL TO BE CHIPPED & STOCKPILED, TO BE USED FOR TEMPORARY STABILIZATION. ALL DISTURBED AREAS TO BE LOAMED & SEEDED. (TYP.)

PROP. WOOD CHIP DIVERSION BERM

PROP. SILT FENCE (TYP.) — 1 / EC-2

PROP. LIMIT OF DISTURBANCE (TYP.)

PROP. TREE LINE (TYP.)

PROPERTY LIMITS (TYP.)

1 / EC-6 PHASE 2 - SEDIMENTATION & EROSION CONTROL PLAN

SCALE : 1" = 40'-0"

40 0 20 40 80

(IN FEET) 1 inch = 40 ft.

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SHEET TITLE:

PHASE 2 SEDIMENTATION & EROSION CONTROL PLAN

SHEET NUMBER:

EC-6

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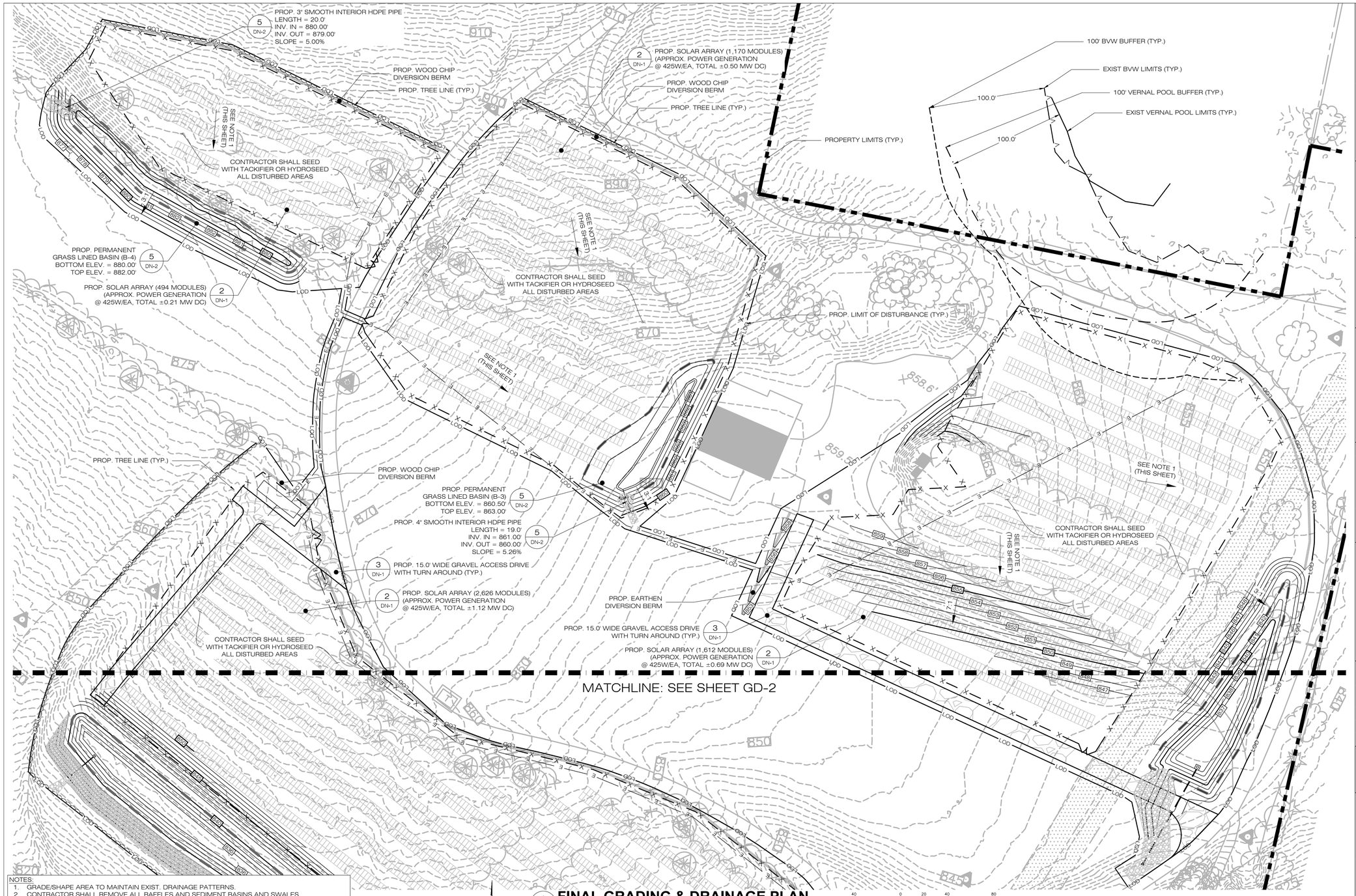

NOTES:
1. GRADE/SHAPE AREA TO MAINTAIN EXIST. DRAINAGE PATTERNS.
2. CONTRACTOR SHALL REMOVE ALL BAFFLES AND SEDIMENT BASINS AND SWALES.
3. CONTRACTOR SHALL REPLACE TEMPORARY SEDIMENT BASIN OUTLET WITH GRAVEL OVERFLOW WEIR UPON THE SITE OR DRAINAGE AREA BEING DEEMED STABILIZED PER THE SWPCP.
4. CONTRACTOR SHALL MODIFY/REPLACE THE TEMPORARY SEDIMENT BASIN RISER AS NEEDED UPON THE SITE OR DRAINAGE AREA BEING DEEMED STABILIZED PER THE SWPCP.

1 GD-1 **FINAL GRADING & DRAINAGE PLAN**
SCALE : 1" = 40'-0"

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APT FILING NUMBER: CT606140

DRAWN BY: JT

DATE: 10/19/21 CHECKED BY: KAM

SHEET TITLE:

FINAL GRADING & DRAINAGE PLAN

SHEET NUMBER:

GD-1

STATE OF CONNECTICUT KEVIN A. MCCAFFERY 25977 LICENSED PROFESSIONAL ENGINEER

MATCHLINE: SEE SHEET GP-1

6 DN-2 PROP. 12" FLARED END SECTION PLUNGE POOL (TYP. OF 2) INV. = 835.00'

1 DN-2 PROP. PERMANENT GRASS LINED BASIN (B-1B) BOTTOM ELEV. = 836.00' TOP ELEV. = 840.00'

2 DN-1 PROP. SOLAR ARRAY (2,626 MODULES) (APPROX. POWER GENERATION @ 425W/EA, TOTAL ±1.12 MW DC)

3 DN-1 PROP. 15.0' WIDE GRAVEL ACCESS DRIVE WITH TURN AROUND (TYP.)

SEE NOTE 1 (THIS SHEET)

4 DN-2 PROP. OUTLET RISER (TYP. OF 2) RIM ELEV. = 838.00' INV. OUT = 836.00'

SEE NOTE 1 (THIS SHEET)

PROP. WOOD CHIP DIVERSION BERM

CONTRACTOR SHALL SEED WITH TACKIFIER OR HYDROSEED ALL DISTURBED AREAS

1 DN-2 PROP. PERMANENT GRASS LINED BASIN (B-2) BOTTOM ELEV. = 837.00' TOP ELEV. = 842.00'

4 DN-2 PROP. OUTLET RISER (TYP.) RIM ELEV. = 839.00' INV. OUT = 837.00'

2 DN-2 PROP. OVERFLOW WEIR (TYP.) SPILLWAY ELEV. = 740.00' SPILLWAY WIDTH = 5.0'

5 DN-2 PROP. 12" SMOOTH INTERIOR HDPE PIPE LENGTH = 94.0' INV. IN = 837.00' INV. OUT = 836.00' SLOPE = 1.06%

6 DN-2 PROP. 12" FLARED END SECTION/ PLUNGE POOL (TYP.) INV. = 836.00'

2 DN-2 PROP. OVERFLOW WEIR ELEV = 839.00'

5 DN-2 PROP. 12" SMOOTH INTERIOR HDPE PIPE (TYP. OF 2) LENGTH = 25.0' INV. IN = 836.00' INV. OUT = 835.00' SLOPE = 4.00%

6 DN-2 PROP. 12" FLARED END SECTION PLUNGE POOL (TYP. OF 2) INV. = 835.00'

4 DN-2 PROP. OUTLET RISER (TYP. OF 2) RIM ELEV. = 815.00' INV. OUT = 813.00'

2 DN-2 PROP. OVERFLOW WIER ELEV = 816.00'

PROP. LIMIT OF DISTURBANCE (TYP.)

PROP. TREE LINE (TYP.)

1 DN-2 PROP. PERMANENT GRASS LINED BASIN (B-1A) BOTTOM ELEV. = 813.00' TOP ELEV. = 817.00'

5 DN-2 PROP. 12" SMOOTH INTERIOR HDPE PIPE LENGTH = 34.0' INV. IN = 813.00' INV. OUT = 812.00' SLOPE = 2.93%

6 DN-2 PROP. 12" FLARED END SECTION PLUNGE POOL (TYP. OF 2) INV. = 812.00'

4 DN-2 PROP. OUTLET RISER (TYP. OF 2) RIM ELEV. = 815.00' INV. OUT = 813.00'

PROP. HARD BOTTOM CROSSING

PROPERTY LIMITS (TYP.)

NOTES:
1. GRADE/SHAPE AREA TO MAINTAIN EXIST. DRAINAGE PATTERNS.
2. CONTRACTOR SHALL REMOVE ALL BAFFLES AND SEDIMENT BASINS AND SWALES.
3. CONTRACTOR SHALL REPLACE TEMPORARY SEDIMENT BASIN OUTLET WITH GRAVEL OVERFLOW WEIR UPON THE SITE OR DRAINAGE AREA BEING DEEMED STABILIZED PER THE SWPCP.
4. CONTRACTOR SHALL MODIFY/REPLACE THE TEMPORARY SEDIMENT BASIN RISER AS NEEDED UPON THE SITE OR DRAINAGE AREA BEING DEEMED STABILIZED PER THE SWPCP.

1 GD-2 **FINAL GRADING & DRAINAGE PLAN**
SCALE : 1" = 40'-0"

40 0 20 40 80
(IN FEET) 1 inch = 40 ft.

LSE INDUS LLC
40 TOWER LANE, SUITE 201
AVON, CT 06001

ALL-POINTS TECHNOLOGY CORPORATION
567 VAUXHALL STREET EXTENSION - SUITE 311
WATERFORD, CT 06385 PHONE: (860)-663-1697
WWW.ALLPOINTSTECH.COM FAX: (860)-663-0935

CSC PERMIT SET

NO	DATE	REVISION
0	10/19/21	FOR REVIEW: KAM
1		
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DESIGN PROFESSIONAL OF RECORD

PROF: KEVIN A. MCCAFFERY, P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION, P.C.
ADD: 567 VAUXHALL STREET EXTENSION - SUITE 311 WATERFORD, CT 06385

OWNER: JOHN BUNCE
ADDRESS: 81 EAST MAIN ST NORTH CANAAN, CT

BUNCE 1 SOLAR FACILITY

SITE ADDRESS: 81 EAST MAIN ST NORTH CANAAN, CT

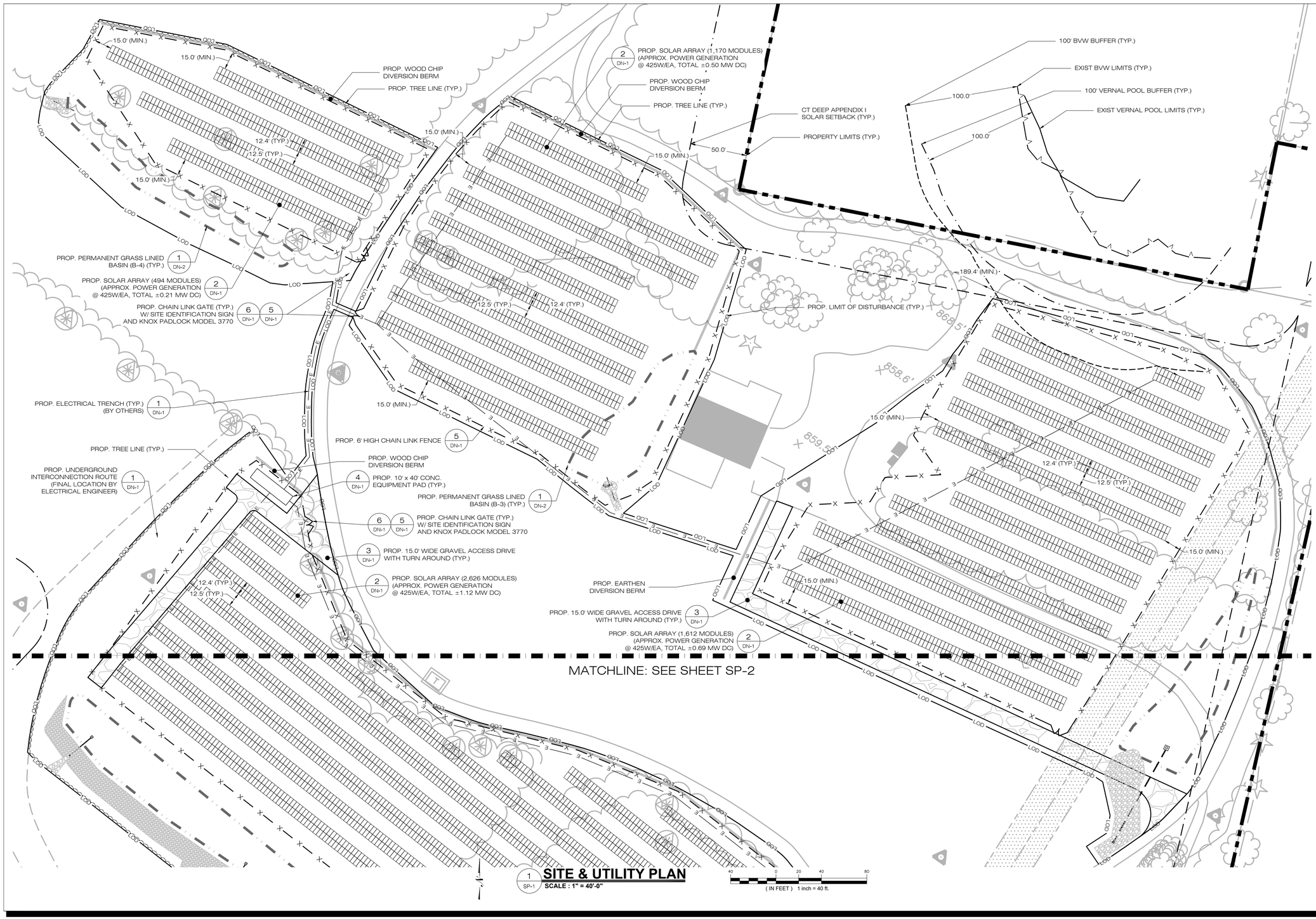
APT FILING NUMBER: CT606140

DRAWN BY: JT
DATE: 10/19/21 CHECKED BY: KAM

SHEET TITLE:
FINAL GRADING & DRAINAGE PLAN

SHEET NUMBER:
GD-2

STATE OF CONNECTICUT KEVIN A. MCCAFFERY 25971 LICENSED PROFESSIONAL ENGINEER



1 SP-1 **SITE & UTILITY PLAN**
SCALE : 1" = 40'-0"

40 0 20 40 80
(IN FEET) 1 inch = 40 ft.

LSE INDUS LLC
40 TOWER LANE, SUITE 201
AVON, CT 06001

ALL-POINTS TECHNOLOGY CORPORATION
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WATERFORD, CT 06385 PHONE: (860)-663-1697
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APT FILING NUMBER: CT606140
DRAWN BY: JT
DATE: 10/19/21 CHECKED BY: KAM

SHEET TITLE:
SITE & UTILITY PLAN

SHEET NUMBER:
SP-1

STATE OF CONNECTICUT KEVIN A. MCCAFFERY 25977 LICENSED PROFESSIONAL ENGINEER

MATCHLINE: SEE SHEET SP-1

1 DN-2 PROP. PERMANENT GRASS LINED BASIN (B-1B)

2 DN-1 PROP. SOLAR ARRAY (2,626 MODULES) (APPROX. POWER GENERATION @ 425W/EA, TOTAL ±1.12 MW DC)

5 DN-1 PROP. 6' HIGH CHAIN LINK FENCE

PROP. 15.0' WIDE GRAVEL ACCESS DRIVE WITH TURN AROUND (TYP.) 3 DN-1

PROP. CHAIN LINK GATE (TYP.) W/ SITE IDENTIFICATION SIGN AND KNOX PADLOCK MODEL 3770 6 DN-1 5 DN-1

PROP. WOOD CHIP DIVERSION BERM

PROP. PERMANENT GRASS LINED BASIN (B-2) 1 DN-2

12.4' (TYP.)

12.5' (TYP.)

15.0' (MIN.)

PROP. LIMIT OF DISTURBANCE (TYP.)

PROP. TREE LINE (TYP.)

PROP. PERMANENT GRASS LINED BASIN (B-1A) 1 DN-2

CT DEEP APPENDIX I SOLAR SETBACK (TYP.)

50.0'

PROPERTY LIMITS (TYP.)

PROP. UTILITY POLE (TYP. OF 3) (SEE ELECTRICAL PLANS FOR DETAILS)

30.0'

PROP. INTERCONNECTION POINT

PROP. UNDERGROUND INTERCONNECTION ROUTE (FINAL LOCATION BY ELECTRICAL ENGINEER) 1 DN-1

LOD

E

X

1 SP-2 **SITE & UTILITY PLAN**
SCALE : 1" = 40'-0"

40 0 20 40 80
(IN FEET) 1 inch = 40 ft.

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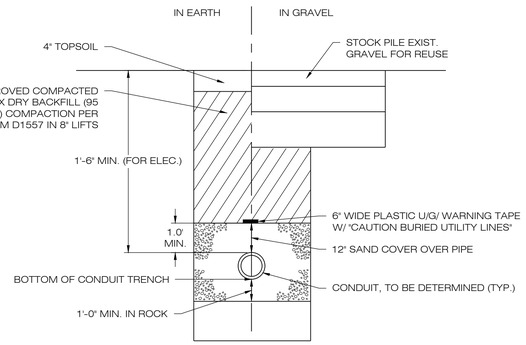
SHEET TITLE:

SITE & UTILITY PLAN

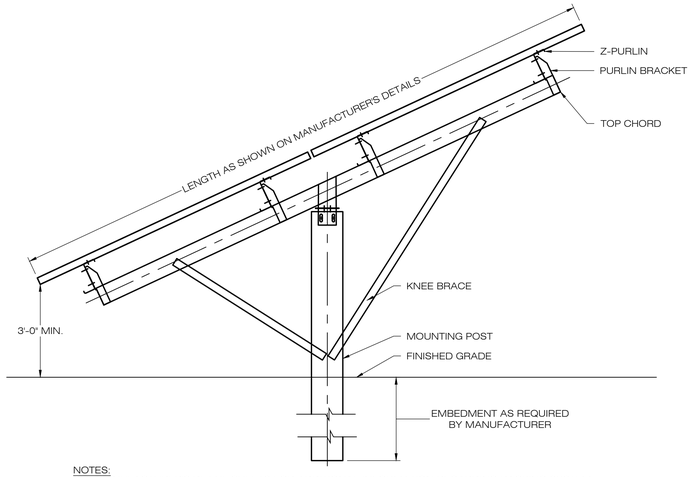
SHEET NUMBER:

SP-2

STATE OF CONNECTICUT KEVIN A. MCCAFFERY 25977 LICENSED PROFESSIONAL ENGINEER

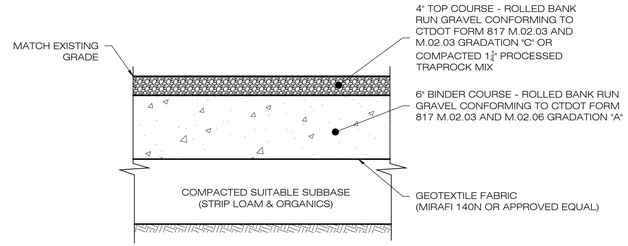


1 DN-1 **ELECTRICAL TRENCH DETAIL**
SCALE : N.T.S.



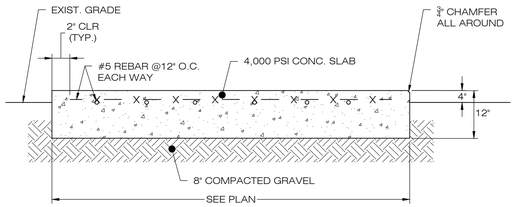
NOTES:
SEE MANUFACTURER'S DETAIL SHEETS FOR ADDITIONAL INFORMATION REGARDING RACKING SYSTEM REQUIREMENTS AND INSTALLATION PROCEDURES. RACKING SYSTEM TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS.

2 DN-1 **TYPICAL POST MOUNTED RACKING SYSTEM**
SCALE : N.T.S.

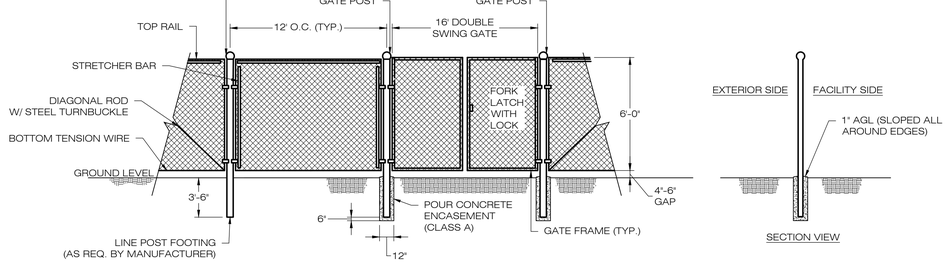


NOTES:
1. SUBBASE MAY CONSIST OF NATIVE MATERIALS IF FOUND ACCEPTABLE BY THE ENGINEER. SUBBASE TO BE COMPACTED TO 95% MAX DRY DENSITY.
2. SUBBASE IS TO BE FREE FROM DEBRIS AND UNSUITABLE MATERIALS.

3 DN-1 **GRAVEL ACCESS DRIVE SECTION**
SCALE : N.T.S.



4 DN-1 **CONCRETE EQUIPMENT PAD**
SCALE : N.T.S.



5 DN-1 **CHAIN-LINK FENCE & GATE DETAIL**
SCALE : N.T.S.

BUNCE 1 SOLAR

IN CASE OF EMERGENCY
CALL T.B.D.

NOTES:
EMERGENCY CALL NUMBER TO BE PROVIDED ONCE DETERMINED.

6 DN-1 **NOTIFICATION SIGN DETAIL**
SCALE : N.T.S.

Ernst Conservation Seeds
8884 Mercer Pike
Meadville, PA 16335
(800) 873-3321 Fax (814) 336-5191
www.ernstseed.com

Date: March 01, 2021

Ernst Solar Farm Seed Mix - ERNMX-186

	Botanical Name	Common Name	Price/lb
45.50 %	*Festuca rubra*	Creeping Red Fescue	2.20
15.00 %	*Festuca ovina var. duriuscula, 'Jetty'*	Hard Fescue, 'Jetty'	3.52
15.00 %	*Festuca ovina var. duriuscula, Gladiator*	Hard Fescue, Gladiator	3.52
10.00 %	*Festuca rubra ssp. commutata*	Chewings Fescue	2.70
5.00 %	*Poa pratensis, 'Selway'*	Kentucky Bluegrass, 'Selway'	3.08
5.00 %	*Poa pratensis, Appalachian*	Kentucky Bluegrass, Appalachian	3.08
4.50 %	*Trifolium repens, Dutch*	White Clover, Dutch	4.84
100.00 %		**Mix Price/lb Bulk:**	**$2.85**

Seeding Rate: 6 lb per 1,000 sq ft
Lawn & Turfgrass Sites; Solar Sites

Provide a 2' clearance between the ground and the solar panels. Mix formulations are subject to change without notice depending on the availability of existing and new products. While the formula may change, the guiding philosophy and function of the mix will not.

6 DN-1 **SOLAR FARM MIX**
SCALE : N.T.S.

LSE INDUS LLC
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BUNCE 1 SOLAR FACILITY

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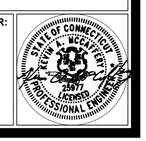
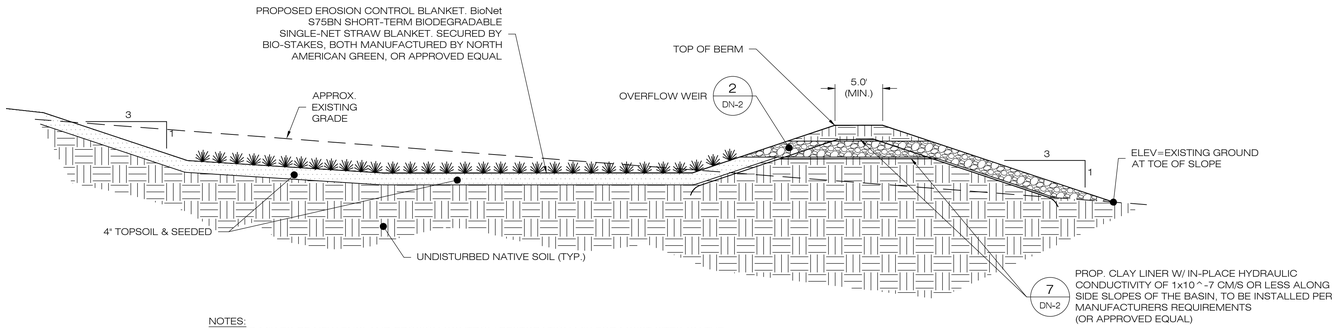
SHEET TITLE:
SITE DETAILS

SHEET NUMBER:
DN-1

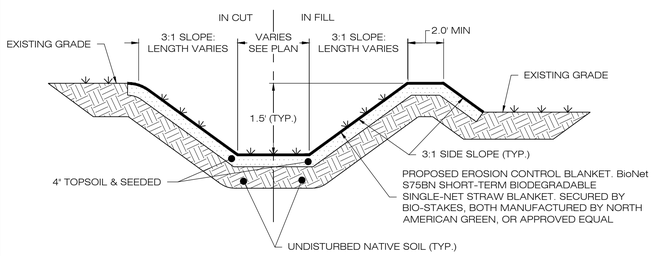




NOTES:
- SEED MIX TO BE NEW ENGLAND EROSION CONTROL/ RESTORATION MIX FOR MOIST SITES ON THE BOTTOM OF THE BASIN AND NEW ENGLAND EROSION/RESTORATION MIX FOR DRY SITES ON THE SIDE SLOPES.
- FOR CONVERTING TEMPORARY SEDIMENT BASIN TO INFILTRATION BASIN, REMOVE BAFFLES, CLEAN OUT SEDIMENT, RESHAPE AS REQUIRED. SEE PLANS FOR BASIN DEPTHS AND ELEVATIONS.
- INSPECT AND CLEAN PIPES.

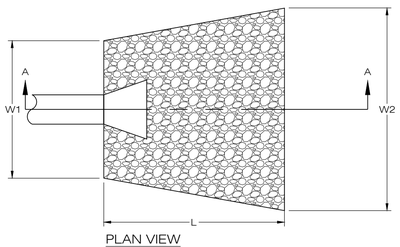
1 DN-2 GRASS LINED BASIN
SCALE : N.T.S.

HDPE OUTLET PIPE SIZING TABLE							
BASIN	TEE TOP ELEV. (FT)	LOW FLOW ORIFICE ELEV.	OUTLET PIPE SIZE (IN.)	OUTLET PIPE LENGTH (FT)	OUTLET PIPE SLOPE (%)	OUTLET PIPE INV. ELEV. AT STRUCTURE (FT)	OUTLET PIPE INV. AT OUTFALL (FT)
B-1A	815.00'	N/A	6"	25.0'	2.00%	813.50'	813.00'
B-1B	838.00'	N/A	6"	25.0'	4.00%	836.00'	835.00'
B-2	839.00'	837.00' (DIA = 3.0")	12"	94.0'	1.06%	837.00'	836.00'
B-3	N/A	N/A	4"	21.0'	2.38%	860.50'	860.00'
B-4	N/A	N/A	3"	20.0'	5.00%	880.00'	879.00'



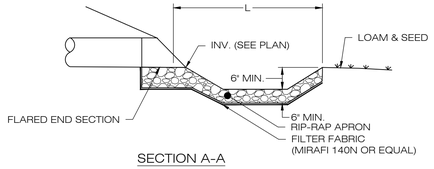
NOTES:
1. SEED MIX TO BE NEW ENGLAND EROSION CONTROL/ RESTORATION MIX FOR MOIST SITES ON THE BOTTOM OF THE BASIN AND NEW ENGLAND EROSION/RESTORATION MIX FOR DRY SITES ON THE SIDE SLOPES.
2. IF DEPTH VARIES FROM 1.5', SEE PLAN CALLOUTS.

3 DN-2 GRASS LINED SWALE
SCALE : N.T.S.



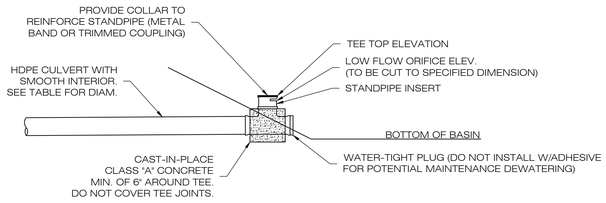
PLAN VIEW

FLARED END SECTION SIZING			
BASIN	MIN. L (FT)	MIN. W1 (FT)	MIN W2 (FT)
B-1A	22.0'	1.50'	12.0'
B-1B	22.0'	1.50'	11.5'
B-2	15.5'	3.0'	10.5'
B-3	12.5'	1.0'	7.5'
B-4	7.0'	0.75'	4.5'



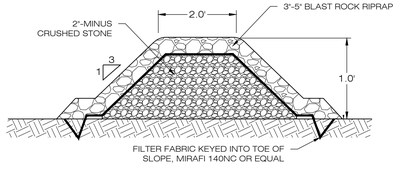
SECTION A-A

6 DN-2 FLARED END SECTION
SCALE : N.T.S.



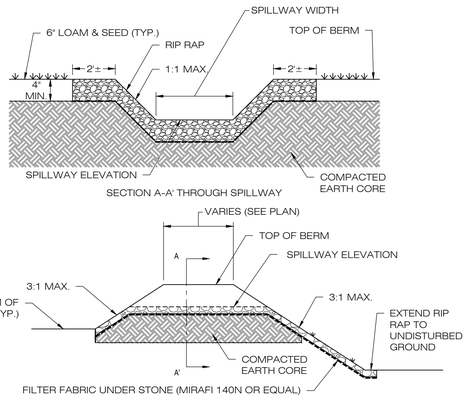
NOTES:
1. TEE TO BE ADS ADVANEDGE (TM) FABRICATED TEE OR APPROVED EQUAL. CONTRACTOR TO MODIFY TEE AS NEEDED.
2. CONVERT TEMPORARY SEDIMENT BASIN RISER TO FINAL BASIN OUTLET RISER.

4 DN-2 OUTLET RISER
SCALE : N.T.S.

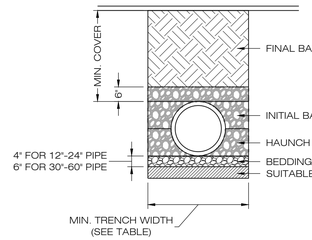


NOTES:
1. STONE SHALL BE PLACED MECHANICALLY OR BY HAND. STONE SHALL NOT BE DUMPED DIRECTLY INTO SWALE.
2. SEE GRADING AND DRAINAGE PLAN.

7 DN-2 STONE CHECK DAM
SCALE : N.T.S.



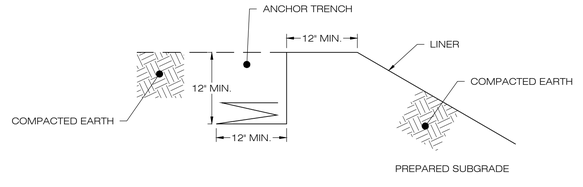
2 DN-2 OVERFLOW WEIR DETAIL
SCALE : N.T.S.



RECOMMENDED MIN. TRENCH WIDTH	
PIPE DIA.	MIN. TRENCH WIDTH
6"	23"
8"	26"
10"	28"
12"	30"
15"	34"
18"	39"
24"	48"
30"	56"
36"	64"
48"	80"
60"	96"

NOTES:
1. ALL PIPE SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321 , "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS", LATEST ADDITION.
2. MEASURES SHOULD BE TAKEN TO PREVENT MIGRATION OF NATIVE FINES INTO BACKFILL MATERIAL, WHEN REQUIRED.
3. FOUNDATION: WHERE THE TRENCH BOTTOM IS UNSTABLE, THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE ENGINEER AND REPLACE WITH SUITABLE MATERIAL AS SPECIFIED BY THE ENGINEER. AS AN ALTERNATIVE AND AT THE DISCRETION OF THE DESIGN ENGINEER, THE TRENCH BOTTOM MAY BE STABILIZED USING A GEOTEXTILE MATERIAL.
4. BEDDING: SUITABLE MATERIAL SHALL BE CLASS I, II OR III. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. UNLESS OTHERWISE NOTED BY THE ENGINEER, MINIMUM BEDDING THICKNESS SHALL BE 4" (100mm) FOR 4"-24" (100mm-600mm); 6" (150mm) FOR 30"-60" (750mm-900mm).
5. INITIAL BACKFILL: SUITABLE MATERIAL SHALL BE CLASS I, II OR III IN THE PIPE ZONE EXTENDING NOT LESS THAN 6" ABOVE CROWN OF PIPE. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. MATERIAL SHALL BE INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION.
6. MINIMUM COVER: MINIMUM COVER, H, IN NON-TRAFFIC APPLICATIONS (GRASS OR LANDSCAPE AREAS) IS 12" FROM THE TOP OF PIPE TO GROUND SURFACE. ADDITIONAL COVER MAY BE REQUIRED TO PREVENT FLOTATION. FOR TRAFFIC APPLICATIONS, MINIMUM COVER, H, IS 12" UP TO 48" DIAMETER PIPE AND 24" OF COVER FOR 54"-60" DIAMETER PIPE, MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TO TOP OF RIGID PAVEMENT.

5 DN-2 HDPE STORM DRAINAGE TRENCH DETAIL
SCALE : N.T.S.



8 DN-2 LINER ANCHOR DETAIL
SCALE : N.T.S.

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SITE DETAILS

SHEET NUMBER:
DN-2

STATE OF CONNECTICUT KEVIN A. MCCAFFERY 25977 LICENSED PROFESSIONAL ENGINEER

ATTACHMENT B

CT DEEP OFFICE OF PLANNING AND PROGRAM DEVELOPMENT CORRESPONDENCE

Mike Libertine

To: Jin Tao; Mike Libertine; Jennifer Young Gaudet; 'cortolano@lodestarenergy.com' <cortolano@lodestarenergy.com>; Jeffrey Macel; kmidei@lodestarenergy.com; dwatson@lodestarenergy.com

Cc: Allen, Karen; Stone, Chris; Hall, Ivonne; Lesniewski, Daniel K; Mirza, Akhila; Lugli, Nicole; Richardson, Amy; Hannon, Robert; Fontanella, Camille; Riese, Frederick; Brunza, Linda; Goclowski, Matthew R; Milne, Beatriz

Subject: Pre-Application Questionnaire - LSE Indus LLC - Bunce Solar

It was a pleasure to meet with you regarding your current proposed activity. Thank you to all who attended.

In summary, LSE Indus, LLC (applicant), is proposing the development and operation of a 1.99 MW (AC) solar photovoltaic generating facility consisting of approximately 5,824 panels
and related inverters and transformers within four (4) fenced areas on adjacent parcels identified in the Town of North Canaan Assessor records as East Main Street, parcel16/046-0 and 81 E Main Street, parcel 16/050-0. The project will be located in the southern portion of the two properties within primarily wooded areas, bisected by existing access ways. Clearing and grading will be required. It is currently anticipated that three water quality basins and one swale will be required. Access and the interconnect line will be from East Main Street. The project limits of disturbance will be +/- 15 acres.

DEEP Permitting Requirements: (Since I was disconnected for a bit, DEEP Staff and Applicant Team, please add anything that I may have missed or misinterpreted! Thank you!)

Stormwater Program: your contacts are Karen Allen and Chris Stone

- A construction stormwater general permit registration or individual permit application is required. Due to the complexity of the project, with greater than 15% slopes and the steep 3:1 grading for the stormwater basins, the stormwater program suggested that an individual permit application may be the best path. An individual permit application processing timeframe would be approximately one year. Stormwater also emphasized that the basins would have to be fully stabilized (seeded and/or armored) before any clearing of wooded areas. This would cause a delay in the project since a full growing season would have to take place for full stabilization. Benches were also highly recommended in the design of the stormwater basins for better erosion and sediment control.
- Applicant is going back to their client to discuss the schedule of implementation discussed today and also revisit their design based on the comments provided at today's meeting.

Dam Safety Program: your contacts are Ivonne Hall and Dan Lesniewski

- Since the basins are designed for impoundment of less than three acre-feet of water (when assuming the water level at the crest of the dam), a Dam Safety Construction Permit will not be required, although the basins will still need to be registered as AA hazard negligible dams. Dam Safety program requested information on how the downstream areas may be affected if the basins were to fail to further determine the status of the basins as dams.

Fisheries Program: your contact is Matt Goclowski

- Due to a Natural Diversity Database Determination, which stated that although there are no known occurrences of any state or federally-listed species within the impact area of the project, our fisheries program should be contacted for consultation due to species found in the Blackberry River running

nearby but outside of the proposed site. Fisheries stated that impact would be minimal if any and that there would be no further consultation required at this time.

Please contact us if you have further questions. I have copied everyone who was in attendance at the meeting.

Meanwhile, if you could help us improve our pre-application process, we would appreciate it! Please complete a quick follow-up survey of 5 questions!

Thank you!

Beatriz Milne, P.E.
Office of Planning and Program Development
Commissioner's Office
Connecticut Department of Energy and Environmental Protection
79 Elm Street, Hartford, CT 06106-5127
P: 860.424.3844 | E: beatriz.milne@ct.gov

Connecticut Department of
ENERGY &
ENVIRONMENTAL
PROTECTION

www.ct.gov/deep

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

ATTACHMENT C

USFWS/NDDB COMPLIANCE STATEMENT

USFWS & NDDB COMPLIANCE

August 4, 2021

Mr. Dan Watson
LSE Indus LLC
40 Tower Lane – Suite 201
Avon, Connecticut 06001

Re: Bunce 1 Solar Facility, 81 East Main Street, North Canaan, Connecticut
APT Job No: CT606140

On behalf of Lodestar Energy, LLC, All-Points Technology Corporation, P.C. ("APT") performed an evaluation with respect to possible federally- and state-listed, threatened, endangered or special concern species in order to determine if the proposed referenced solar energy generation facility (the "Facility" or "Project") would result in a potential adverse effect to listed species.

APT understands that Lodestar Energy, LLC proposes the construction of a solar energy generation facility in the southeastern portion of property located at 81 East Main Street (State Route 44) in North Canaan, Connecticut ("Subject Property"). The Facility would be located within upland forest located both north and south of an existing cleared field on the Subject Property.

USFWS

The federal consultation was completed in accordance with Section 7 of the Endangered Species Act through the U.S. Fish and Wildlife Service's ("USFWS") Information, Planning, and Conservation System ("IPaC"). Based on the results of the IPaC review, two federally-listed[1] threatened species are known to occur in the vicinity of the Subject Property documented as the northern long-eared bat ("NLEB"; *Myotis septentrionalis*) and Bog Turtle (*Clemmys muhlenbergii*). As a result of this preliminary finding, APT performed an evaluation to determine if the proposed referenced Facility would result in a likely adverse effect to NLEB and Bog Turtle.

The proposed Facility would be located in upland forest and would require ±7.3 acres of tree clearing; trees potentially provide NLEB habitat. Consultation with the Connecticut Department of Energy & Environmental Protection ("CTDEEP") Wildlife Division Natural Diversity Data Base ("NDDB") revealed that the proposed Facility is not within 150 feet of a known occupied NLEB maternity roost tree and is not within 0.25 mile of a known NLEB hibernaculum. The nearest NLEB habitat resource to the proposed Facility is located ±2.73 miles to the west/southwest in Salisbury.

APT submitted the effects determination using the NLEB key within the IPaC system for the proposed Facility (the "Action"). This IPaC key assists users in determining whether a Federal action is consistent with the activities analyzed in the USFWS's January 5, 2016, intra-Service Programmatic Biological Opinion ("PBO") on the Final 4(d) Rule for the NLEB for Section 7(a)(2) compliance.

[1] Listing under the federal Endangered Species Act

Based upon the IPaC submission, the Action is consistent with activities analyzed in the PBO; please refer to the enclosed June 11, 2021, USFWS letter. The Action may affect NLEB; however, any take that may occur as a result of the Action is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR §17.40(o). If the USFWS does not respond within 30 days from the date of the letter (July 12, 2021), one may presume that the IPaC-assisted determination was correct and that the PBO satisfies and concludes Lodestar's responsibilities for this Action under ESA Section 7(a)(2) with respect to NLEB. No response was received from USFWS; therefore, the Action complies with ESA Section 7(a)(2) with respect to NLEB.

In addition, Lodestar Energy, LLC would consider the following USFWS voluntary conservation measures, where appropriate and as the project schedule allows, to reduce the potential for impact to NLEB.

- Conduct tree removal activities outside of the NLEB pup season (June 1-July 31) and active season (April 1-October 31) to minimize impacts to pups at roosts not yet identified.
- Avoid clearing suitable spring staging and fall swarming habitat within a five-mile radius of known or assumed NLEB hibernacula during the staging and swarming seasons (April 1-May 15 and August 15-November 14, respectively).
- Maintain dead trees (snags) and large trees when possible.
- Use herbicides and pesticides only if unavoidable. If necessary, spot treatment is preferred over aerial application.
- Minimize exterior lighting, opting for down-shielded, motion-sensor security lights instead of constant illumination.

A Biological Assessment was performed for Bog Turtle through the IPaC system. The "Bog Turtle (*Clemmys muhlenbergii*), Northern Population, Recovery Plan" (prepared by Michael Klemens, Ph.D. and dated May 15, 2001) and Amphibians and Reptiles of Connecticut and Adjacent Regions (Klemens, 1993) identifies bog turtle habitat as "*calcareous wet meadows, pastures, and fens, usually bordered by shrub and red-maple swamps… [that are] characterized by a continuous flow of water seeping through the saturated surface soil and [contain] an extremely diverse vegetational community*" and *"Bog Turtles inhabit small pockets of open-canopy habitat located within these diverse and dynamic wetland ecosystems.*".

The proposed Project action area would not impact any wetland habitat. One wetland area, characterized by an apparent perennial watercourse system, was identified just east of the access drive in proximity to the proposed Facility. Although this watercourse system is developed in limestone (calcareous) soils, it does not contain wet meadow or fen habitat (primarily a closed canopy forested wetland) and therefore does not support preferred Bog Turtle habitat. Therefore, since no suitable habitat for Bog Turtle is supported within the Project action area, the Project would result in "No effect" to this species and no consultation with USFWS is required. Please refer to the attached Biological Assessment report.

NDDB

The Subject Property is not located within a DEEP Natural Diversity Data Base ("NDDB") buffer area, but a buffer area is located ±0.04 mile to the south across Route 44. A NDDB review request was submitted to DEEP, who issued an August 28, 2020, NDDB Determination letter (No. 202009902) indicating that there are no reported populations of State or Federal listed species on the Subject Property; please refer to the attached letter. The letter did mention that populations of State Endangered Burbot (*Lota lota*) and Special Concern Slimy Sculpin (*Cottus cognatus*) are located in the Blackberry River, which is located ±0.3 mile south of the Subject Property. The Determination letter also mentioned that if any stormwater will be discharged to the Blackberry River, the DEEP Fisheries biologist should be consulted. The proposed Facility would not directly discharge stormwater to the Blackberry River. However, stormwater treated in accordance with the 2004 Connecticut Stormwater Manual would discharge to a stream located along the east side of the Subject Property, which eventually flows into Blackberry River. The DEEP Fisheries biologist will be consulted once the site plans and stormwater management system design have been finalized. Any potential fisheries issues identified by DEEP Fisheries, including to the two listed species, along with any recommended mitigation measures will be incorporated into the final design to ensure no negative impacts to State-listed species would result from the Facility.

Therefore, the proposed Lodestar Energy, LLC Facility is not anticipated to adversely impact any Federal or State threatened, endangered or species of special concern.

Sincerely,
All-Points Technology Corporation, P.C.

Dean Gustafson
Senior Biologist

Enclosures

USFWS NLEB Letter

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104
http://www.fws.gov/newengland

IPaC Record Locator: 521-102921000 June 11, 2021

Subject: Consistency letter for the 'Lodestar Energy - Bunce 1 Solar Facility' project indicating that any take of the northern long-eared bat that may occur as a result of the Action is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR §17.40(o).

Dear Deborah Gustafson:

The U.S. Fish and Wildlife Service (Service) received on June 11, 2021 your effects determination for the 'Lodestar Energy - Bunce 1 Solar Facility' (the Action) using the northern long-eared bat (*Myotis septentrionalis*) key within the Information for Planning and Consultation (IPaC) system. You indicated that no Federal agencies are involved in funding or authorizing this Action. This IPaC key assists users in determining whether a non-Federal action may cause "take"[1] of the northern long-eared bat that is prohibited under the Endangered Species Act of 1973 (ESA) (87 Stat.884, as amended; 16 U.S.C. 1531 et seq.).

Based upon your IPaC submission, any take of the northern long-eared bat that may occur as a result of the Action is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR §17.40(o). Unless the Service advises you within 30 days of the date of this letter that your IPaC-assisted determination was incorrect, this letter verifies that the Action is not likely to result in unauthorized take of the northern long-eared bat.

Please report to our office any changes to the information about the Action that you entered into IPaC, the results of any bat surveys conducted in the Action area, and any dead, injured, or sick northern long-eared bats that are found during Action implementation.

If your Action proceeds as described and no additional information about the Action's effects on species protected under the ESA becomes available, no further coordination with the Service is required with respect to the northern long-eared bat.

The IPaC-assisted determination for the northern long-eared bat **does not** apply to the following ESA-protected species that also may occur in your Action area:

- Bog Turtle *Clemmys muhlenbergii* Threatened

You may coordinate with our Office to determine whether the Action may cause prohibited take of the animal species listed above.

---

[1]Take means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct [ESA Section 3(19)].

Action Description
You provided to IPaC the following name and description for the subject Action.

1. Name

Lodestar Energy - Bunce 1 Solar Facility

2. Description

The following description was provided for the project 'Lodestar Energy - Bunce 1 Solar Facility':

> Lodestar Energy proposes to lease a portion of the Site, which consists of two parcels (identified as E Main Street, parcel 16/046-0 and 81 E Main Street, parcel 16/050-0 in the Town of North Canaan records) for Project development. The facility will be designed to generate more than one (1) megawatt (“MW”) of electricity (but less than 2 MWs).

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@42.02225305,-73.3133455205016,14z

Determination Key Result

This non-Federal Action may affect the northern long-eared bat; however, any take of this species that may occur incidental to this Action is not prohibited under the final 4(d) rule at 50 CFR §17.40(o).

Determination Key Description: Northern Long-eared Bat 4(d) Rule
This key was last updated in IPaC on **May 15, 2017**. Keys are subject to periodic revision.

This key is intended for actions that may affect the threatened northern long-eared bat.

The purpose of the key for non-Federal actions is to assist determinations as to whether proposed actions are excepted from take prohibitions under the northern long-eared bat 4(d) rule.

If a non-Federal action may cause prohibited take of northern long-eared bats or other ESA-listed animal species, we recommend that you coordinate with the Service.

Determination Key Result

Based upon your IPaC submission, any take of the northern long-eared bat that may occur as a result of the Action is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR §17.40(o).

Qualification Interview

1. Is the action authorized, funded, or being carried out by a Federal agency?

   No

2. Will your activity purposefully **Take** northern long-eared bats?

   No

3. [Semantic] Is the project action area located wholly outside the White-nose Syndrome Zone?

   Automatically answered
   No

4. Have you contacted the appropriate agency to determine if your project is near a known hibernaculum or maternity roost tree?

   Location information for northern long-eared bat hibernacula is generally kept in state Natural Heritage Inventory databases – the availability of this data varies state-by-state. Many states provide online access to their data, either directly by providing maps or by providing the opportunity to make a data request. In some cases, to protect those resources, access to the information may be limited. A web page with links to state Natural Heritage Inventory databases and other sources of information on the locations of northern long-eared bat roost trees and hibernacula is available at www.fws.gov/midwest/endangered/mammals/nleb/nhisites.html.

   Yes

5. Will the action affect a cave or mine where northern long-eared bats are known to hibernate (i.e., hibernaculum) or could it alter the entrance or the environment (physical or other alteration) of a hibernaculum?

   No

6. Will the action involve Tree Removal?

   Yes

7. Will the action only remove hazardous trees for the protection of human life or property?

   No

8. Will the action remove trees within 0.25 miles of a known northern long-eared bat hibernaculum at any time of year?

   No

9. Will the action remove a known occupied northern long-eared bat maternity roost tree or any trees within 150 feet of a known occupied maternity roost tree from June 1 through July 31?

   No

Project Questionnaire

If the project includes forest conversion, report the appropriate acreages below. Otherwise, type '0' in questions 1-3.

1. Estimated total acres of forest conversion:

15

2. If known, estimated acres of forest conversion from April 1 to October 31

15

3. If known, estimated acres of forest conversion from June 1 to July 31

15

If the project includes timber harvest, report the appropriate acreages below. Otherwise, type '0' in questions 4-6.

4. Estimated total acres of timber harvest

0

5. If known, estimated acres of timber harvest from April 1 to October 31

0

6. If known, estimated acres of timber harvest from June 1 to July 31

0

If the project includes prescribed fire, report the appropriate acreages below. Otherwise, type '0' in questions 7-9.

7. Estimated total acres of prescribed fire

0

8. If known, estimated acres of prescribed fire from April 1 to October 31

0

9. If known, estimated acres of prescribed fire from June 1 to July 31

0

If the project includes new wind turbines, report the megawatts of wind capacity below. Otherwise, type '0' in question 10.

10. What is the estimated wind capacity (in megawatts) of the new turbine(s)?

0

USFWS Biological Assessment Report

Lodestar Energy - Bunce 1 Solar Facility

Biological Assessment

Prepared using IPaC

Generated by Deborah Gustafson (dleonardo@allpointstech.com)

August 3, 2021

The purpose of this Biological Assessment (BA) is to assess the effects of the proposed project and determine whether the project may affect any Federally threatened, endangered, proposed or candidate species. This BA is prepared in accordance with legal requirements set forth under Section 7 of the Endangered Species Act (16 U.S.C. 1536 (c)).

In this document, any data provided by U.S. Fish and Wildlife Service is based on data as of August 3, 2021.

Prepared using IPaC version 5.62.3

Lodestar Energy - Bunce 1 Solar Facility Biological Assessment

Table Of Contents

1 Description Of The Action

1.1 Project Name

Lodestar Energy - Bunce 1 Solar Facility

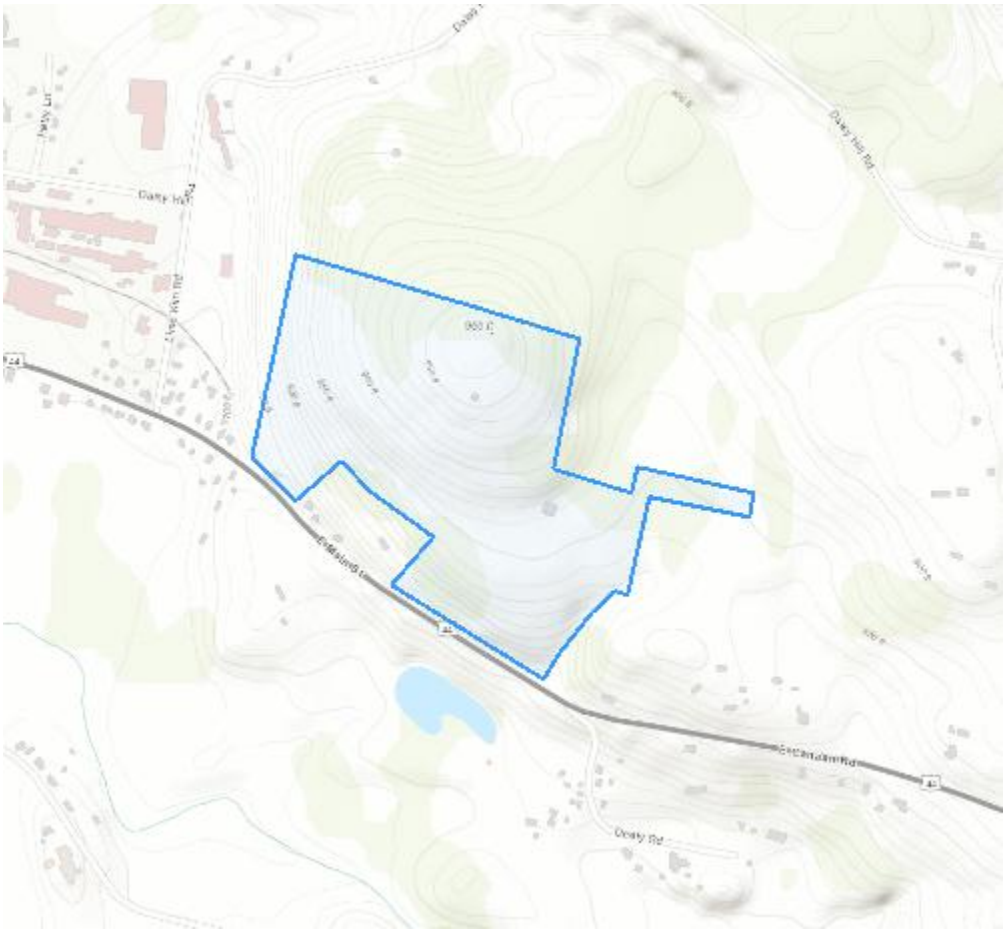
1.2 Executive Summary

Based on the information you provided, write a short, high-level summary of your project. Ideally, this should be one paragraph.

Effect determination summary

1.3 Project Description

1.3.1 Location



LOCATION
Litchfield County, Connecticut

1.3.2 Description of project habitat

The subject property is dominated with mixed hardwood-white pine forest with smaller components of residential development, lawn, hayfield and forested wetland habitats.

1.3.3 Project proponent information

Provide information regarding who is proposing to conduct the project, and their contact information. Please provide details on whether there is a Federal nexus.

Requesting Agency
All-Points Technology Corporation, P.C.

FULL NAME
Deborah Gustafson

STREET ADDRESS
567 Vauxhall Street Extension

Suite 311

CITY	STATE	ZIP
Waterford	CT	06235

PHONE NUMBER	E-MAIL ADDRESS
(860) 984-9514	dleonardo@allpointstech.com

Lead agency
CT Siting Council

1.3.4 Project purpose

Clearly describe the purpose and need for the proposed project, including a brief description of all proposed actions in relation to the defined needs. Essentially, explain why the project is being proposed, e.g., to provide new road access, to provide housing, etc.

1.3.5 Project type and deconstruction

In this section, deconstruct (or, subdivide) the proposed action into all of its activities and structures, including all of the project elements (e.g., construction, operation, maintenance). For each activity and structure, describe the "who, what, when, where, and how" at an appropriate level of detail for evaluating the exposure and response of the species and critical habitats to that activity.

The activities and structures you identify will provide the headings under which the Effects Analysis (i.e., effects of the action) for the species and critical habitat will be organized in Section 2 below and in your final document (i.e., biological assessment or other environmental review document). Later you will describe each activity and structure in greater detail.

For this section, consider all activities related to the following portions of your project, where applicable:

- *Project timeline and sequencing*
- *Site preparation*
- *Construction access and staging*
- *Post-project site restoration*
- *Conservation and compensation activities (both on- and off-site)*
- *Operations and maintenance*

1.3.6 Anticipated environmental stressors

Describe the anticipated effects of your proposed project on the aspects of the land, air and water that will occur due to the activities above. These should be based on the activity deconstructions done in the previous section and will be used to inform the action area.

1.4 Action Area

The action area is the specific spatial polygon encompassing all of the areas where land, water, or air will be detectably changed due to the proposed project and any other activities that would not occur but for the proposed action. This typically does not include the broader area where affected wildlife might travel or move to after being exposed to those modifications within the action area. The action area should not be confused with other geographic descriptions, such as: analysis area, project area, recovery unit, management unit, etc. These may be helpful in analyzing population effects, but are not an equivalent substitute for the regulatory description of an action area.

Depending on the nature of the project, the action area may extend beyond the limits of the actual project location. IPaC will prompt you through the process to help you determine an appropriate action area. Once determined, effects to species should be considered throughout the action area.

1.5 Conservation Measures

1.6 Prior Consultation History

Provide information on any previous consultation(s) on this project with USFWS, including dates and outcomes. Information from prior consultations may be helpful to the biologist reviewing the project. If you wish to upload/attach consultation documents, please do so under Section '1.8 Other Reports and helpful Information'.

1.7 Other Agency Partners And Interested Parties

Identify any other agencies (Federal, State, Local, Tribal) involved in the project, and include each agency's role, the appropriate contact, and their contact information. Also, as applicable and available, provide information regarding any known interested parties.

1.8 Other Reports And Helpful Information

Communicate any other helpful information that you have not previously provided. You can also upload additional files that may be helpful (e.g., reports) and they will become an Appendix to this document.

2 Species Effects Analysis

This section describes, species by species, the effects of the proposed action on listed, proposed, and candidate species, and the habitat on which they depend. In this document, effects are broken down as direct interactions (something happening directly to the species) or indirect interactions (something happening to the environment on which a species depends that could then result in effects to the species).

These interactions encompass effects that occur both during project construction and those which could be ongoing after the project is finished. All effects, however, should be considered, including effects from direct and indirect interactions and cumulative effects.

2.1 Bog Turtle

This species has been excluded from analysis in this environmental review document.

Relevant documentation

An evaluation of habitats present at the subject property was performed.

The “Bog Turtle (Clemmys muhlenbergii), Northern Population, Recovery Plan” (prepared by Michael Klemens, Ph.D and dated May 15, 2001) and Amphibians and Reptiles of Connecticut and Adjacent Regions (Klemens, 1993) identifies bog turtle habitat as “calcareous wet meadows, pastures, and fens, usually bordered by shrub and red-maple swamps… [that are] characterized by a continuous flow of water seeping through the saturated surface soil and [contain] an extremely diverse vegetational community” and “Bog Turtles inhabit small pockets of open-canopy habitat located within these diverse and dynamic wetland ecosystems.”

One wetland area, characterized by an apparent perennial watercourse system, was identified just east of the access drive in proximity to the proposed solar facility. Although this watercourse system is developed in limestone (calcareous) soils, it does not contain wet meadow or fen habitat (primarily a closed canopy forested wetland) and therefore does not support preferred bog turtle habitat.

Justification for exclusion

No suitable bog turtle habitat is present on the subject property.

2.2 Northern Long-Eared Bat

3 Critical Habitat Effects Analysis

No critical habitats intersect with the project action area.

4 Summary Discussion, Conclusion, And Effect Determinations

4.1 Effect Determination Summary

SPECIES (COMMON NAME)	SCIENTIFIC NAME	LISTING STATUS	PRESENT IN ACTION AREA	EFFECT DETERMINATION
Bog Turtle	Clemmys muhlenbergii	Threatened	No	NE
Northern Long-eared Bat	Myotis septentrionalis	Threatened		

4.2 Summary Discussion

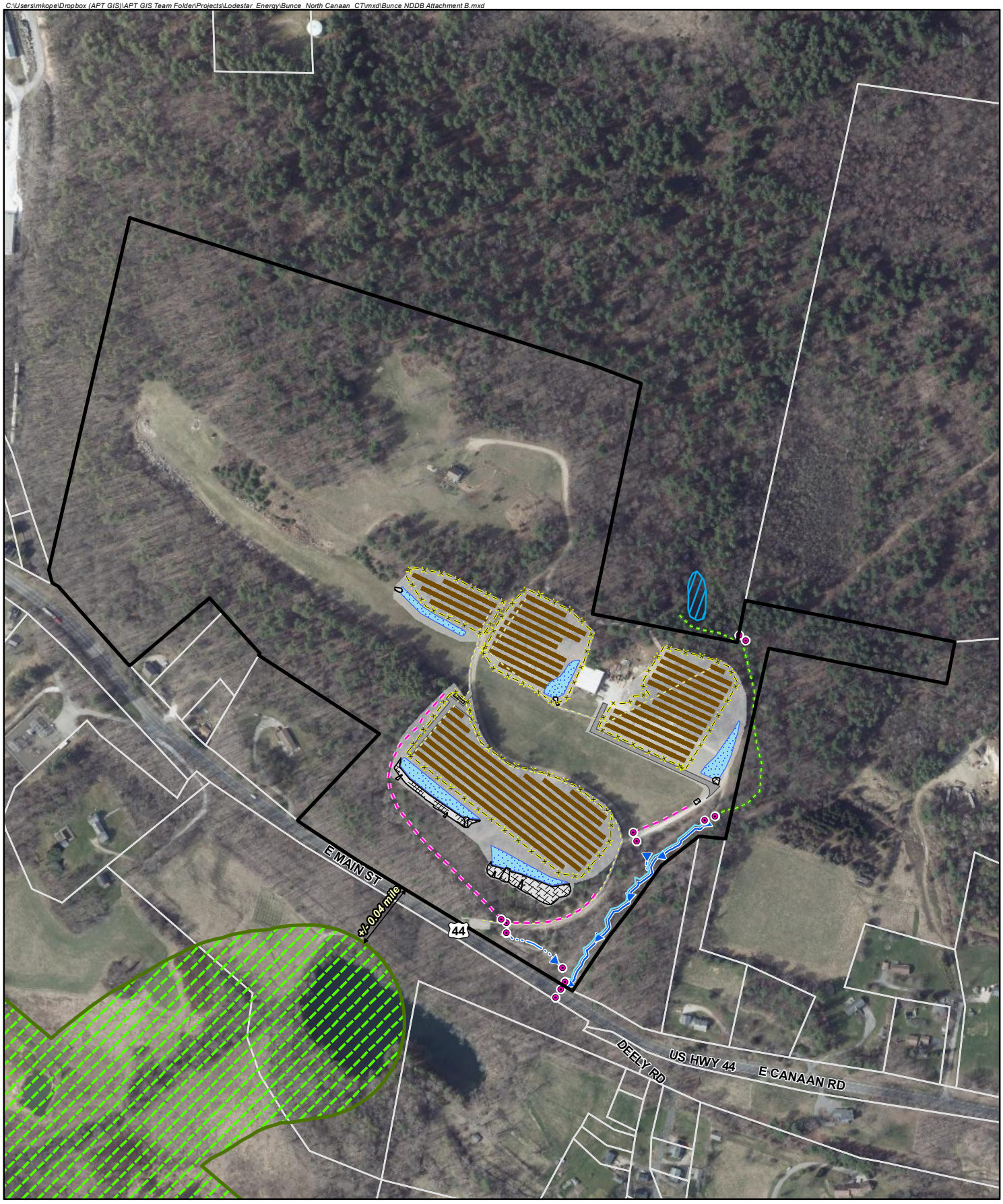
Describe in summary form the overall effects your proposed project will have to species and critical habitat within your action area.

4.3 Conclusion

Provide clear statements of conclusion that help USFWS understand your findings.

NDDB Map

C:\Users\mkope\Dropbox (APT GIS)\APT GIS Team Folder\Projects\Lodestar Energy\Bunce North Canaan CT\mxd\Bunce NDDB Attachment B.mxd



Legend

- Site
- Existing Drainage Ditch
- Approximate Wetland Boundary
- Delineated Bank Boundary (OHWM)
- Delineated Intermittent Watercourse
- Perennial Stream
- Interconnection Path (UD)
- Perimeter Fence
- Solar Modules
- Conc. Equip. Pad
- Gravel Access Road
- Stormwater Basin
- Riprap Slope Protection
- Natural Diversity Database (updated June 2021)
- Potential Vernal Pool
- Limit of Disturbance
- Existing Culvert
- Approximate Parcel Boundary
- Municipal Boundary

N

400 200 0 400 Feet

Map Notes:
Base Map Source: CTECO 2019 Aerial Photograph
Map Scale:1 inch = 400 feet
Map Date: October 2021

NDDB Map

ProposedSolar Energy Facility
81 East Main Street
North Canaan, CT

LODESTAR ENERGY

ALL-POINTS TECHNOLOGY CORPORATION

NDDB Determination Letter

Connecticut Department of
ENERGY &
ENVIRONMENTAL
PROTECTION

79 Elm Street • Hartford, CT 06106-5127 www.ct.gov/deep Affirmative Action/Equal Opportunity Employer

August 28, 2020

Dean Gustafson
All Points Technology Corporatino PC
567 Vauxhall St Ext Suite 311
Waterford CT 06385
dgustafson@allpointstech.com

Project: Solar energy facility, Bunce 1 North Canaan, 81 East Main St, North Canaan, CT
NDDB Determination No.: 202009902

Dear Mr. Gustafson,

I have reviewed Natural Diversity Database (NDDB) maps and files regarding the area of work provided for the proposed solar energy facility at 81 East Main Street in North Canaan, Connecticut. According to our records there are no reported populations of state or federal listed species on this property. There are many state listed species in the wider area mainly associated with large forested blocks on Canaan Mountain as well as populations of State Endangered Burbot (*Lota lota*) and Special Concern Slimy sculpin (*Cottus cognatus*) in the Blackberry River.

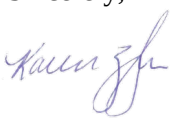
If any stormwater will be discharged to the Blackberry River the you should consult with a DEEP Fisheries biologist. Please be advised that a DEEP Fisheries Biologist may review the permit applications you submit to DEEP regulatory programs to determine if your project could adversely affect state listed fish. DEEP Fisheries Biologists are routinely involved in pre-application consultations with regulatory staff and applicants in order to identify potential fisheries issues and work with applicants to mitigate negative effects, including to endangered species. If you have not already talked with a Fisheries Biologist about your project, you may contact the Permit Analyst assigned to process your application for further information, including the contact information for the Fisheries Biologist assigned to review your application.

We have not visited this site. We would recommend biological surveys as part of your planning in order to more completely assess the site. The result of this review does not preclude the possibility that listed species may be encountered on site and that additional action may be necessary to remain in compliance with certain state permits. This determination is good for two years. Please re-submit a new NDDB Request for Review if the scope of work changes or if work has not begun on this project by August 28, 2022.

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

Please contact me if you have further questions at (860) 424-3378, or karen.zyko@ct.gov . Thank you for consulting the Natural Diversity Database.

Sincerely,



Karen Zyko
Environmental Analyst

ATTACHMENT D

CULTURAL RESOURCES

RECONNAISSANCE SURVEY REPORT

MARCH 2021

PHASE IA CULTURAL RESOURCES ASSESSMENT SURVEY OF THE PROPOSED BUNCE SOLAR CENTER IN NORTH CANAAN, CONNECTICUT

PREPARED FOR:

ALL-POINTS TECHNOLOGY CORPORATIO
567 VAUXHALL STREET EXTENSION – SUITE 311
WATERFORD, CT 06385

PREPARED BY:

HERITAGE CONSULTANTS
55 EAST CEDAR STREET
NEWINGTON, CONNECTICUT 06111

ABSTRACT

This report presents the results of a Phase IA cultural resources assessment survey for a proposed solar facility located at 81 East Main Street in North Canaan, Connecticut. The project parcel associated with the proposed solar facility encompasses approximately 68 acres of land. Only a portion of this parcel will be developed as part of the solar center. The current investigation consisted of: 1) preparation of an overview of the region's prehistory, history, and natural setting); 2) a literature search to identify and discuss previously recorded cultural resources in vicinity of the project parcel; 3) a review of readily available historical maps and aerial imagery depicting the impact areas to identify potential historical resources and/or areas of past disturbance within and near them; and 4) pedestrian survey and photo-documentation of the impact areas to determine their archaeological sensitivity. The results of the survey indicate that both project area is characterized mostly by steep and uneven topography, and it has undergone previous impacts such as land clearing, and grading activities. No additional archaeological investigation of the proposed project area is recommended prior to development of the solar center.

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LIST OF FIGURES

LIST OF PHOTOS

CHAPTER I
INTRODUCTION

This report presents the results of a Phase IA cultural resources assessment survey of a proposed solar facility (the Facility) in North Canaan, Connecticut (Figure 1). All-Points Technology Corporation (All-Points) requested that Heritage Consultants, LLC (Heritage) complete the assessment survey as part of the planning process for the Facility, which will be located within a 68 acre parcel of land at 81 East Main Street. The Facility will not occupy the entire parcel, but only a small portion of it. Heritage completed this investigation on behalf of All-Points on in March of 2021. All work associated with this project was performed in accordance with the *Environmental Review Primer for Connecticut's Archaeological Resources* (Poirier 1987), which is promulgated by the Connecticut State Historic Preservation Office (CT-SHPO).

Project Description and Methods Overview

The project will include the construction of the Facility and associated infrastructure, which will include photovoltaic panels and associated electrical equipment. This Phase IA cultural resources assessment survey consisted of the completion of the following tasks: 1) a contextual overview of the region's prehistory, history, and natural setting (e.g., soils, ecology, hydrology, etc.); 2) a literature search to identify and discuss previously completed cultural resources surveys and previously recorded cultural resources in the region encompassing the project area; 3) a review of readily available historical maps and aerial imagery depicting the project area in order to identify potential historical resources and/or areas of past disturbance; and 4) pedestrian survey and photo-documentation of the project area in order to determine their archaeological sensitivity.

Project Results and Management Recommendations Overview

The review of historical maps and aerial images of the project region and files maintained by the CT-SHPO, as well as pedestrian survey of the development area, resulted in the identification of 12 previously identified archaeological sites in the vicinity of the Facility. These include Sites 100-2A, 100-2B, 100-3A, 100-3B, 100-5A, 100-5B, 100-6, 100-7, 100-8, 100-66, 100-71, and 100-72. Their presence demonstrates that prehistoric and historical archaeological resources exist in the region containing the Facility; they are discussed further in Chapter V of this document. In addition, two National Register of Historic Places areas (Canaan Village Historic District and the Samuel Forbes Homestead), two individually-listed National Register properties (Union Depot and the Lawrence Tavern), and three State Register properties (Canaan Railroad Station, the Captain Isaac Lawrence House, and the Colonel Joseph Peet House) also were identified in the vicinity of the Facility.

As well as the cultural resources discussed above, Heritage combined data from the historical map and aerial image analysis, and the pedestrian survey to aid in assessment of the archaeological sensitivity of the impact areas associated with the Facility. Following pedestrian survey of the project area, which included a thorough walkover of the impact areas, as well as photo-documentation, it was determined that the impact area is characterized by uneven topography, steep slopes, and a landscape that has previously disturbed by clearing and grading. Therefore, it is the professional opinion of Heritage that no additional archaeological examination of the proposed impact areas is recommended prior to construction of the proposed Facility.

Project Personnel

Key personnel for this project included Mr. David R. George, M.A., R.P.A (Principal Investigator); Mr. Antonio Medina, B.A. (Operations Manager); Ms. Kelsey Tuller, M.A., (Field Supervisor); Dr. Kristen Keegan (Historian); and Mr. Tevin Jourdain, B.A. (GIS Specialist).

CHAPTER II
NATURAL SETTING

Introduction

This chapter provides a brief overview of the natural setting of the region containing the proposed Facility. Previous archaeological research has documented that a few specific environmental factors can be associated with both prehistoric and historical period site selection. These include general ecological conditions, as well as types of fresh water sources and soils present. The remainder of this section provides a brief overview of the ecology, hydrological resources, and soils present within the impact areas and the larger region in general.

Ecoregions of Connecticut

Throughout the Pleistocene and Holocene Periods, Connecticut has undergone numerous environmental changes. Variations in climate, geology, and physiography have led to the "regionalization" of Connecticut's modern environment. It is clear, for example, that the northwestern portion of the state has very different natural characteristics than the coastline. Recognizing this fact, Dowhan and Craig (1976), as part of their study of the distribution of rare and endangered species in Connecticut, subdivided the state into various ecoregions. Dowhan and Craig (1976:27) defined an ecoregion as:

> "an area characterized by a distinctive pattern of landscapes and regional climate as expressed by the vegetation composition and pattern, and the presence or absence of certain indicator species and species groups. Each ecoregion has a similar interrelationship between landforms, local climate, soil profiles, and plant and animal communities. Furthermore, the pattern of development of plant communities (chronosequences and toposequences) and of soil profile is similar in similar physiographic sites. Ecoregions are thus natural divisions of land, climate, and biota."

Dowhan and Craig defined nine major ecoregions for the State of Connecticut. They are based on regional diversity in plant and animal indicator species (Dowhan and Craig 1976). Only one of the ecoregions is germane to the current investigation: Northern Marble Valley ecoregion. A brief summary of this ecoregion is presented below. It is followed by a discussion of the hydrology and soils found in and adjacent to the project area.

<u>Northern Marble Valley Ecoregion</u>

The Northern Marble Valley ecoregion consists of interior valleys, lowlands, and extensive floodplains adjacent to steep valley walls. The Marble Valley's territory stretches up and down the western Connecticut boundary line, following the Housatonic River (Dowhan and Craig 1976). With respect to the ecoregion's elevation, the valley floor ranges from 76.2 to 152.4 m (250 to 500 ft), with the maximum reaching 213.4 m (700 ft) between the valley and upland regions (Dowhan and Craig 1976:41). The Northern Marble Valley is one of three subregions within the Marble Valley, however, all three consist of "soils that are developed on glacial tills in higher areas and on extensive deposits of stratified sand, gravel, silt, and some clay," (Dowhan and Craig 1976:41). Calcium-rich bedrock lies beneath the valleys which is evident in the soil types and characteristics from the ecoregion.

Hydrology in the Vicinity of the Project area

The proposed Facility is situated within a region that contains to several sources of freshwater, including the Housatonic River, the Blackberry River, the Konkapot River, Squabble Brook, Washining Lake, and Washinee Lake, as well as several unnamed streams, ponds, and wetlands. These freshwater sources may

have served as resource extraction areas for Native American and historical populations. Previously completed archaeological investigations in Connecticut have demonstrated that streams, rivers, and wetlands were focal points for prehistoric occupations because they provided access to transportation routes, sources of freshwater, and abundant faunal and floral resources.

Soils Comprising the Project Area

Soil formation is the direct result of the interaction of many variables, including climate, vegetation, parent material, time, and organisms present (Gerrard 1981). Once archaeological deposits are buried within the soil, they are subject to various diagenic and taphonomic processes. Different classes of artifacts may be preferentially protected, or unaffected by these processes, whereas others may deteriorate rapidly. Cyclical wetting and drying, freezing, and thawing, and compression can accelerate chemically and mechanically the decay processes for animal bones, shells, lithics, ceramics, and plant remains. Lithic and ceramic artifacts are largely unaffected by soil pH, whereas animal bones and shells decay more quickly in acidic soils. In contrast, acidic soils enhance the preservation of charred plant remains.

A review of the soils within the proposed impact areas is presented below. They are characterized by three major soil types which are Charlton, Chatfield, and Stockbridge (Figure 2). A review of these soils shows that they are well drained loams that are typically correlated with prehistoric and historical use and occupation. Descriptive profiles for each soil type are presented below; they were gathered from the National Resources Conservation Service.

Charlton Soils:

The Charlton series consists of very deep, well drained soils formed in loamy melt-out till. They are nearly level to very steep soils on moraines, hills, and ridges. A typical profile associated with Charlton soils is as follows: **Oe** -- 0 to 4 cm; black (10YR 2/1) moderately decomposed forest plant material. (0 to 5 cm thick.) **A** -- 4 to 10 cm; dark brown (10YR 3/3) fine sandy loam; weak fine granular structure; very friable; many fine roots; 5 percent gravel; very strongly acid; abrupt smooth boundary; **Bw1** -- 10 to 18 cm; brown (7.5YR 4/4) fine sandy loam; weak coarse granular structure; very friable; many fine and medium roots; 5 percent gravel; very strongly acid; clear wavy boundary; **Bw2** -- 18 to 48 cm; yellowish brown (10YR 5/6) fine sandy loam; weak medium subangular blocky structure; very friable; common fine and medium roots; 10 percent gravel and cobbles; very strongly acid; clear wavy boundary; **Bw3** -- 48 to 69 cm; light olive brown (2.5Y 5/4) gravelly fine sandy loam; massive; very friable; few medium roots; 15 percent gravel and cobbles; very strongly acid; abrupt wavy boundary; and **C** -- 69 to 165 cm; grayish brown (2.5Y 5/2) gravelly fine sandy loam with thin lenses of loamy sand; massive; friable, some lenses firm; few medium roots; 25 percent gravel and cobbles; strongly acid.

Chatfield Soils:

The Chatfield series consists of well drained soils formed in loamy melt-out till. They are moderately deep to bedrock. They are nearly level to very steep soils on bedrock-controlled hills and ridges. A typical profile associated with Chatfield soils is as follows: **Oi** -- 0 to 3 cm, slightly decomposed leaf, needle, and twig litter; extremely acid, pH 4.2.; **A** -- 3 to 5 cm, very dark gray (10YR 3/1) fine sandy loam, gray (10YR 5/1), dry; weak fine subangular blocky structure; friable; many fine and medium roots throughout; 5 percent mixed gravel and cobbles; very strongly acid, pH 4.5; abrupt smooth boundary; **Bw1** -- 5 to 33 cm, strong brown (7.5YR 5/6) gravelly fine sandy loam; weak fine subangular blocky structure; friable; common fine roots throughout and common medium roots throughout; 15 percent mixed gravel and cobbles; very strongly acid, pH 4.5; abrupt wavy boundary; **Bw2** -- 33 to 76 cm, strong brown (7.5YR 5/6) gravelly fine sandy loam; moderate medium subangular blocky structure; friable; few

fine roots throughout; 20 percent mixed rock fragments; very strongly acid, pH 4.5; abrupt irregular boundary; and **2R** -- 76 cm; fractured slightly-weathered schist bedrock.

Stockbridge Soils:

The Stockbridge series consists of very deep, well drained soils formed in loamy calcareous till. They are nearly level to very steep soils on till plains, smooth hills, low ridges and drumloidal landforms. A typical profile associated with Stockbridge soils is as follows: **Ap** -- 0 to 10 inches; dark brown (10YR 3/3) loam, light brownish gray (2.5Y 6/2) dry; weak coarse granular structure; friable; many fine and very fine roots; 10 percent gravel; moderately acid; clear smooth boundary; **Bw1** -- 10 to 20 inches; olive brown (2.5Y 4/4) loam; weak coarse subangular blocky structure; friable; common fine roots; 10 percent gravel; neutral; clear wavy boundary; **Bw2** -- 20 to 28 inches; light olive brown (2.5Y 5/4) loam; weak coarse subangular blocky structure; firm; few fine roots; few weathered limestone fragments in lower part; 10 percent gravel; neutral; gradual wavy boundary; **C1** -- 28 to 42 inches; olive (5Y 4/3) gravelly loam; weak thick platy structure; firm; few fine roots; many brown (10YR 4/3) weathered limestone fragments and few grayish brown (2.5Y 5/2) streaks; 15 percent gravel and 2 percent cobbles; neutral; gradual wavy boundary; **C2** -- 42 to 48 inches; olive (5Y 4/3) gravelly loam; weak thick platy structure; firm; few brown (10YR 4/3) and light gray (10YR 7/1) streaks from weathered and partially weathered limestone and quartzite fragments; 15 percent gravel and 2 percent cobbles; slight effervescence; slightly alkaline; gradual wavy boundary; and **C3** -- 48 to 65 inches; olive (5Y 4/3) gravelly loam; weak thick platy structure; firm; few brown (10YR 4/3) and light gray (10YR 7/1) streaks from weathered and partially weathered limestone and quartzite fragments; 15 percent gravel and 2 percent cobbles; slight effervescence; moderately alkaline.

CHAPTER III
PREHISTORIC SETTING

Introduction

Prior to the late 1970s and early 1980s, few systematic archaeological surveys of large portions of the state of Connecticut had been undertaken. Rather, the prehistory of the region was studied at the site level. Sites chosen for excavation were highly visible and located in the coastal zone, e.g., shell middens, and Connecticut River Valley. As a result, a skewed interpretation of the prehistory of Connecticut was developed. It was suggested that the upland portions of the state, i.e., the northeastern and northwestern hills ecoregions, were little used and rarely occupied by prehistoric Native Americans, while the coastal zone, i.e., the eastern and western coastal and the southeastern and southwestern hills ecoregions, were the focus of settlements and exploitation in the prehistoric era. This interpretation remained unchallenged until the 1970s and 1980s when several town-wide and regional archaeological studies were completed. These investigations led to the creation of several archaeological phases that subsequently were applied to understand the prehistory of Connecticut. The remainder of this chapter provides an overview of the prehistoric setting of the region encompassing the project area.

Paleo-Indian Period (12,000 to 10,000 Before Present [B.P.])

The earliest inhabitants of the area encompassing the State of Connecticut, who have been referred to as Paleo-Indians, arrived in the area by ca., 12,000 B.P. (Gramly and Funk 1990; Snow 1980). Due to the presence of large Pleistocene mammals at that time and the ubiquity of large fluted projectile points in archaeological deposits of this age, Paleo-Indians often have been described as big-game hunters (Ritchie and Funk 1973; Snow 1980); however, as discussed below, it is more likely that they hunted a broad spectrum of animals.

While there have been numerous surface finds of Paleo-Indian projectile points throughout the State of Connecticut, only two sites, the Templeton Site (6-LF-21) in Washington, Connecticut and the Hidden Creek Site (72-163) in Ledyard, Connecticut, have been studied in detail and dated using the radiocarbon method (Jones 1997; Moeller 1980). The Templeton Site (6-LF-21) is located in Washington, Connecticut and was occupied between 10,490 and 9,890 years ago (Moeller 1980). In addition to a single large and two small fluted points, the Templeton Site produced a stone tool assemblage consisting of gravers, drills, core fragments, scrapers, and channel flakes, which indicates that the full range of stone tool production and maintenance took place at the site (Moeller 1980). Moreover, the use of both local and non-local raw materials was documented in the recovered tool assemblage, suggesting that not only did the site's occupants spend some time in the area, but they also had access to distant stone sources, the use of which likely occurred during movement from region to region.

The only other Paleo-Indian site studied in detail in Connecticut is the Hidden Creek Site (72-163) (Jones 1997). The Hidden Creek Site is situated on the southeastern margin of the Great Cedar Swamp on the Mashantucket Pequot Reservation in Ledyard, Connecticut. While excavation of the Hidden Creek Site produced evidence of Terminal Archaic and Woodland Period components (see below) in the upper soil horizons, the lower levels of the site yielded artifacts dating from the Paleo-Indian era. Recovered Paleo-Indian artifacts included broken bifaces, side-scrapers, a fluted preform, gravers, and end-scrapers. Based on the types and number of tools present, Jones (1997:77) has hypothesized that the Hidden

Creek Site represented a short-term occupation, and that separate stone tool reduction and rejuvenation areas were present.

While archaeological evidence for Paleo-Indian occupation is scarce in Connecticut, it, combined with data from the West Athens Road and King's Road Site in the Hudson drainage and the Davis and Potts Sites in northern New York, supports the hypothesis that there was human occupation of the area not long after ca. 12,000 B.P. (Snow 1980). Further, site types currently known suggest that the Paleo-Indian settlement pattern was characterized by a high degree of mobility, with groups moving from region to region in search of seasonally abundant food resources, as well as for the procurement of high-quality raw materials from which to fashion stone tools.

Archaic Period (10,000 to 2,700 B.P.)

The Archaic Period, which succeeded the Paleo-Indian Period, began by ca., 10,000 B.P. (Ritchie and Funk 1973; Snow 1980), and it has been divided into three subperiods: Early Archaic (10,000 to 8,000 B.P.), Middle Archaic (8,000 to 6,000 B.P.), and Late Archaic (6,000 to 3,400 B.P.). These periods were devised to describe all non-farming, non-ceramic producing populations in the area. Regional archeologists recently have recognized a final "transitional" Archaic Period, the Terminal Archaic Period (3,400-2,700 B.P.), which was meant to describe those groups that existed just prior to the onset of the Woodland Period and the widespread adoption of ceramics into the toolkit (Snow 1980; McBride 1984; Pfeiffer 1984, 1990; Witthoft 1949, 1953).

Early Archaic Period (10,000 to 8,000 B.P.)

To date, few Early Archaic sites have been identified in southern New England. As a result, researchers such as Fitting (1968) and Ritchie (1969) have suggested a lack of these sites likely is tied to cultural discontinuity between the Early Archaic and preceding Paleo-Indian Period, as well as a population decrease from earlier times. However, with continued identification of Early Archaic sites in the region, and the recognition of the problems of preservation, it is difficult to maintain the discontinuity hypothesis (Curran and Dincauze 1977; Snow 1980).

Like their Paleo-Indian predecessors, Early Archaic sites tend to be small and produce few artifacts, most of which are not temporally diagnostic. While Early Archaic sites in other portions the United States are represented by projectile points of the Kirk series (Ritchie and Funk 1973) and by Kanawha types (Coe 1964), sites of this age in southern New England are recognized on the basis of a series of ill-defined bifurcate-based projectile points. These projectile points are identified by the presence of their characteristic bifurcated base, and they generally are made from high quality raw materials. Moreover, finds of these projectile points have rarely been in stratified contexts. Rather, they occur commonly either as surface expressions or intermixed with artifacts representative of later periods. Early Archaic occupations, such as the Dill Farm Site and Sites 6LF64 and 6LF70 in Litchfield County, and are represented by camps that were relocated periodically to take advantage of seasonally available resources (McBride 1984; Pfeiffer 1986). In this sense, a foraging type of settlement pattern was employed during the Early Archaic Period.

Middle Archaic Period (8,000 to 6,000 B.P.)

By the onset of the Middle Archaic Period, essentially modern deciduous forests had developed in the region (Davis 1969). It is at this time that increased numbers and types of sites are noted in Connecticut (McBride 1984). The most well-known Middle Archaic site in New England is the Neville Site, which is located in Manchester, New Hampshire and studied by Dincauze (1976). Careful analysis of the Neville Site indicated that the Middle Archaic occupation dated from between ca., 7,700 and 6,000 years ago. In

fact, Dincauze (1976) obtained several radiocarbon dates from the Middle Archaic component of the Neville Site. The dates, associated with the then-newly named Neville type projectile point, ranged from 7,740±280 and 7,015±160 B.P. (Dincauze 1976).

In addition to Neville points, Dincauze (1976) described two other projectile points styles that are attributed to the Middle Archaic Period: Stark and Merrimac projectile points. While no absolute dates were recovered from deposits that yielded Stark points, the Merrimac type dated from 5,910±180 B.P. Dincauze argued that both the Neville and later Merrimac and Stark occupations were established to take advantage of the excellent fishing that the falls situated adjacent to the site area would have afforded Native American groups. Thus, based on the available archaeological evidence, the Middle Archaic Period is characterized by continued increases in diversification of tool types and resources exploited, as well as by sophisticated changes in the settlement pattern to include different site types, including both base camps and task-specific sites (McBride 1984:96)

Late Archaic Period (6,000 to 3,700 B.P.)

The Late Archaic Period in southern New England is divided into two major cultural traditions that appear to have coexisted. They include the Laurentian and Narrow-Stemmed Traditions (Funk 1976; McBride 1984; Ritchie 1969a and b). Artifacts assigned to the Laurentian Tradition include ground stone axes, adzes, gouges, ulus (semi-lunar knives), pestles, atlatl weights, and scrapers. The diagnostic projectile point forms of this time period in southern New England include the Brewerton Eared-Notched, Brewerton Eared and Brewerton Side-Notched varieties (McBride 1984; Ritchie 1969a; Thompson 1969). In general, the stone tool assemblage of the Laurentian Tradition is characterized by flint, felsite, rhyolite and quartzite, while quartz was largely avoided for stone tool production.

In terms of settlement and subsistence patterns, archaeological evidence in southern New England suggests that Laurentian Tradition populations consisted of groups of mobile hunter-gatherers. While a few large Laurentian Tradition occupations have been studied, sites of this age generally encompass less than 500 m^2 (5,383 ft^2). These base camps reflect frequent movements by small groups of people in search of seasonally abundant resources. The overall settlement pattern of the Laurentian Tradition was dispersed in nature, with base camps located in a wide range of microenvironments, including riverine as well as upland zones (McBride 1978, 1984:252). Finally, subsistence strategies of Laurentian Tradition focused on hunting and gathering of wild plants and animals from multiple ecozones.

The second Late Archaic tradition, known as the Narrow-Stemmed Tradition, is unlike the Laurentian Tradition, and it likely represents a different cultural adaptation. The Narrow-Stemmed tradition is recognized by the presence of quartz and quartzite narrow stemmed projectile points, triangular quartz Squibnocket projectile points, and a bipolar lithic reduction strategy (McBride 1984). Other tools found in Narrow-Stemmed Tradition artifact assemblages include choppers, adzes, pestles, antler and bone projectile points, harpoons, awls, and notched atlatl weights. Many of these tools, notably the projectile points and pestles, indicate a subsistence pattern dominated by hunting and fishing, as well the collection of a wide range of plant foods (McBride 1984; Snow 1980:228).

The Terminal Archaic Period (3,700 to 2,700 B.P.)

The Terminal Archaic, which lasted from ca., 3,700 to 2,700 BP, is perhaps the most interesting, yet confusing of the Archaic Periods in southern New England prehistory. Originally termed the “Transitional Archaic” by Witthoft (1953) and recognized by the introduction of technological innovations, e.g., broadspear projectile points and soapstone bowls, the Terminal Archaic has long posed problems for regional archeologists. While the Narrow-Stemmed Tradition persisted through the Terminal Archaic

and into the Early Woodland Period, the Terminal Archaic is coeval with what appears to be a different technological adaptation, the Susquehanna Tradition (McBride 1984; Ritchie 1969b). The Susquehanna Tradition is recognized in southern New England by the presence of a new stone tool industry that was based on the use of high-quality raw materials for stone tool production and a settlement pattern different from the "coeval" Narrow-Stemmed Tradition.

The Susquehanna Tradition is based on the classification of several Broadspear projectile point types and associated artifacts. There are several local sequences within the tradition, and they are based on projectile point type chronology. Temporally diagnostic projectile points of these sequences include the Snook Kill, Susquehanna Broadspear, Mansion Inn, and Orient Fishtail types (Lavin 1984; McBride 1984; Pfeiffer 1984). The initial portion of the Terminal Archaic Period (ca., 3,700-3,200 BP) is characterized by the presence of Snook Kill and Susquehanna Broadspear projectile points, while the latter Terminal Archaic (3,200-2,700 BP) is distinguished by the use of Orient Fishtail projectile points (McBride 1984:119; Ritchie 1971).

In addition, it was during the late Terminal Archaic that interior cord marked, grit tempered, thick walled ceramics with conoidal (pointed) bases made their initial appearance in the Native American toolkit. These are the first ceramics in the region, and they are named Vinette I (Ritchie 1969a; Snow 1980:242); this type of ceramic vessel appears with much more frequency during the ensuing Early Woodland Period. In addition, the adoption and widespread use of soapstone bowls, as well as the implementation of subterranean storage, suggests that Terminal Archaic groups were characterized by reduced mobility and longer-term use of established occupation sites (Snow 1980:250).

Finally, while settlement patterns appeared to have changed, Terminal Archaic subsistence patterns were analogous to earlier patterns. The subsistence pattern still was diffuse in nature, and it was scheduled carefully. Typical food remains recovered from sites of this period consist of fragments of white-tailed deer, beaver, turtle, fish and various small mammals. Botanical remains recovered from the site area consisted of *Chenopodium* sp., hickory, butternut and walnut (Pagoulatos 1988:81). Such diversity in food remains suggests at least minimal use of a wide range of microenvironments for subsistence purposes.

Woodland Period (2,700 to 350 B.P.)

Traditionally, the advent of the Woodland Period in southern New England has been associated with the introduction of pottery; however, as mentioned above, early dates associated with pottery now suggest the presence of Vinette I ceramics appeared toward the end of the preceding Terminal Archaic Period (Ritchie 1969a; McBride 1984). Like the Archaic Period, the Woodland Period has been divided into three subperiods: Early, Middle, and Late Woodland. The various subperiods are discussed below.

<u>Early Woodland Period (ca., 2,700 to 2,000 B.P.)</u>

The Early Woodland Period of the northeastern United States dates from ca., 2,700 to 2,000 B.P., and it has thought to have been characterized by the advent of farming, the initial use of ceramic vessels, and increasingly complex burial ceremonialism (Griffin 1967; Ritchie 1969a and 1969b; Snow 1980). In the Northeast, the earliest ceramics of the Early Woodland Period are thick walled, cord marked on both the interior and exterior, and possess grit temper.

Careful archaeological investigations of Early Woodland sites in southern New England have resulted in the recovery of narrow stemmed projectile points in association with ceramic sherds and subsistence remains, including specimens of White-tailed deer, soft and hard-shell clams, and oyster shells (Lavin

and Salwen: 1983; McBride 1984:296-297; Pope 1952). McBride (1984) has argued that the combination of the subsistence remains and the recognition of multiple superimposed cultural features at various sites indicates that Early Woodland Period settlement patterns were characterized by multiple re-use of the same sites on a seasonal basis by small co-residential groups.

Middle Woodland Period (2,000 to 1,200 B.P.)

The Middle Woodland Period is marked by an increase in the number of ceramic types and forms utilized (Lizee 1994a), as well as an increase in the amount of exotic lithic raw material used in stone tool manufacture (McBride 1984). The latter suggests that regional exchange networks were established, and that they were used to supply local populations with necessary raw materials (McBride 1984; Snow 1980). The Middle Woodland Period is represented archaeologically by narrow stemmed and Jack's Reef projectile points; increased amounts of exotic raw materials in recovered lithic assemblages, including chert, argillite, jasper, and hornfels; and conoidal ceramic vessels decorated with dentate stamping. Ceramic types indicative of the Middle Woodland Period include Linear Dentate, Rocker Dentate, Windsor Cord Marked, Windsor Brushed, Windsor Plain, and Hollister Stamped (Lizee 1994a:200).

In terms of settlement patterns, the Middle Woodland Period is characterized by the occupation of village sites by large co-residential groups that utilized native plant and animal species for food and raw materials in tool making (George 1997). These sites were the principal place of occupation, and they were positioned close to major river valleys, tidal marshes, estuaries, and the coastline, all of which would have supplied an abundance of plant and animal resources (McBride 1984:309). In addition to villages, numerous temporary and task-specific sites were utilized in the surrounding upland areas, as well as in closer ecozones such as wetlands, estuaries, and floodplains. The use of temporary and task-specific sites to support large village populations indicates that the Middle Woodland Period was characterized by a resource acquisition strategy that can best be termed as logistical collection (McBride 1984:310).

Late Woodland Period (ca., 1,200 to 350 B.P.)

The Late Woodland Period in southern New England dates from ca., 1,200 to 350 B.P., and it is characterized by the earliest evidence for the use of corn in the lower Connecticut River Valley (Bendremer 1993; Bendremer and Dewar 1993; Bendremer et al. 1991; George 1997; McBride 1984); an increase in the frequency of exchange of non-local lithics (Feder 1984; George and Tryon 1996; McBride 1984; Lavin 1984); increased variability in ceramic form, function, surface treatment, and decoration (Lavin 1980, 1986, 1987; Lizee 1994a, 1994b); and a continuation of a trend towards larger, more permanent settlements in riverine, estuarine, and coastal ecozones (Dincauze 1974; McBride 1984; Snow 1980).

Stone tool assemblages associated with Late Woodland occupations, especially village-sized sites, are functionally variable and they reflect plant and animal resource processing and consumption on a large scale. Finished stone tools recovered from Late Woodland sites include Levanna and Madison projectile points; drills; side-, end-, and thumbnail scrapers; mortars and pestles; nutting stones; netsinkers; and celts, adzes, axes, and digging tools. These tools were used in activities ranging from hide preparation to plant processing to the manufacture of canoes, bowls, and utensils, as well as other settlement and subsistence-related items (McBride 1984; Snow 1980). Finally, ceramic assemblages recovered from Late Woodland sites are as variable as the lithic assemblages. Ceramic types identified include Windsor Fabric Impressed, Windsor Brushed, Windsor Cord Marked, Windsor Plain, Clearview Stamped, Sebonac Stamped, Selden Island, Hollister Plain, Hollister Stamped, and Shantok Cove Incised (Lavin 1980, 1988a,

1988b; Lizee 1994a; Pope 1953; Rouse 1947; Salwen and Ottesen 1972; Smith 1947). These types are more diverse stylistically than their predecessors, with incision, shell stamping, punctation, single point, linear dentate, rocker dentate stamping, and stamp and drag impressions common (Lizee 1994a:216).

Summary of Connecticut Prehistory

The prehistory of Connecticut spans from ca., 12,000 to 350 B.P., and it is characterized by numerous changes in tool types, subsistence patterns, and land use strategies. Much of the prehistoric era is characterized by local Native American groups who practiced a subsistence pattern based on a mixed economy of hunting and gathering wild plant and animal resources. It is not until the Late Woodland Period that evidence for the use of domesticated species is available. Further, settlement patterns throughout the prehistoric era shifted from seasonal occupations of small co-residential groups to large aggregations of people in riverine, estuarine, and coastal ecozones. In terms of the region containing the proposed project area, a variety of prehistoric site types may be expected. These range from seasonal camps utilized by Archaic populations to temporary and task-specific sites of the Woodland era.

CHAPTER IV
HISTORICAL OVERVIEW

Introduction

As discussed in Chapter I, the proposed Facility will be located to the north of Route 44 in the town of North Canaan in Litchfield County, Connecticut. Litchfield County was the last region of Connecticut to be fully colonized. Although its main river, the Housatonic, and its tributaries provided useful sources of waterpower during the industrializing period, only a few towns in the region were able to turn that advantage into substantial and sustained population growth. Most of the county's towns continued to have agriculture-based economies, occasionally leavened by summer tourism and related industries. Its rugged topography, with only small areas of good farmland, was a disadvantage for field crop agriculture and something of an advantage for tourism. As a result of these conditions and overall trends in agriculture, most Litchfield County towns witnessed their populations shrink during the nineteenth and into the twentieth centuries. More recently, however, many of these smaller towns began to grow again, due to exurban residential trends of the later twentieth and early twenty-first centuries. Nonetheless, as of the 2010 census, only five of the county's 26 municipalities reported populations of over 10,000 people; the largest municipality only had almost 36,000 residents (Keegan 2012; Rossano 1997). The town of North Canaan is something of an exception to these overall trends. In the late nineteenth and twentieth centuries, for the reasons discussed below, it witnessed sustained, if modest, population growth.

Native American History

Connecticut historical tradition holds that the "River Indians," a term that included the "Windsor Indians," attempted to ally themselves with English settlers to counteract the power of the Pequot Tribe to the southeast (Stiles 1892:103-104). A contrary interpretation would be that the leaders of one or more small independent groups of Native Americans considered the alliance but did not have enough political power to decide for the entire area. This debate is influenced by the interpretations of the colonists themselves. Comfortable with the idea that land tenure derives from a sovereign, the English repeatedly tried to identify such a sovereign among the Native Americans so that they could arrange the land transfer from the native sovereign to their own. Consequently, local historians' attention to Native American matters often has been focused on the identification to which of several larger tribal groups or confederations these small local groups belonged, in order to explain their supposed place in the larger political scheme and demonstrate the legitimacy of the town fathers' land purchases (or, in some areas, that the local Native Americans had been subjects of the Pequots, and so were dispossessed of their land in the 1637 war).

Relatively little is known about the Native Americans of the northwest highlands region of Connecticut. Given the rough topography and elevation of the general area, it must be assumed that pre-Contact Native Americans there were seasonally shifting horticulturists who also relied a great deal on hunting and fishing for their livelihoods. Post-contact development in the region included the arrival of many lowland natives who had been pushed or driven out by the colonists. Documented colonial-era villages in the northwest highlands are mainly located along the Housatonic River, which is only about a mile west of the project area. Early historians of Connecticut's Native Americans, notably J.W. De Forest (1852), believed that before the northwestern part of Connecticut was an entirely uninhabited wilderness through which Mohawk raiding parties from New York passed at will. As was noted above, since early historians have focused largely on political interactions with significant Native American

tribes, it is not surprising that De Forest overlooked the small communities that most likely existed in the northwestern part of Connecticut. According to Matthias Spiess, an early twentieth century anthropologist, the Mohawks actually claimed what is now northwest Connecticut, so that none of the other tribes dared to settle there, but by the early eighteenth century the Mohawks' influence had declined to the point that a variety of other Native American bands moved into, or perhaps reclaimed, the region (Spiess 1934).

The keys to understanding Native American settlement in the Northwest Highlands are its history of early Dutch settlement, disease, and the lateness of extensive colonization of the area. Substantial research by Shirley Dunn (1994, 2000) has found that the Mohican tribe had a territory extending from what is now Dutchess County to Lake Champlain, and from the east bank of the Housatonic River westward to past Schenectady. This does not mean the literal east bank of the Housatonic, but some difficult-to-define distance eastward from it, probably including at least four or five miles, well into Canaan and North Canaan. Because, as is discussed below, the eastern boundary of New York was poorly defined, enterprising Dutch colonists purchased Native American rights to the area. Between 1685 and 1704, a series of their purchases from Mohican landholders effectively cleared the title to this area, in English eyes. These Native groups also suffered badly from repeated disease outbreaks and Mohawk raiding parties. In addition, the Native Americans who settled at Stockbridge in Massachusetts also sold or re-sold much of the southwestern corner of Massachusetts and also adjacent parts of New York and Connecticut (Wright 1905). Local Connecticut historians do not appear to have been aware of these early transactions, which explains why they are not discussed in their histories. This means that specific information about the Native American inhabitants of Canaan and North Canaan remains elusive.

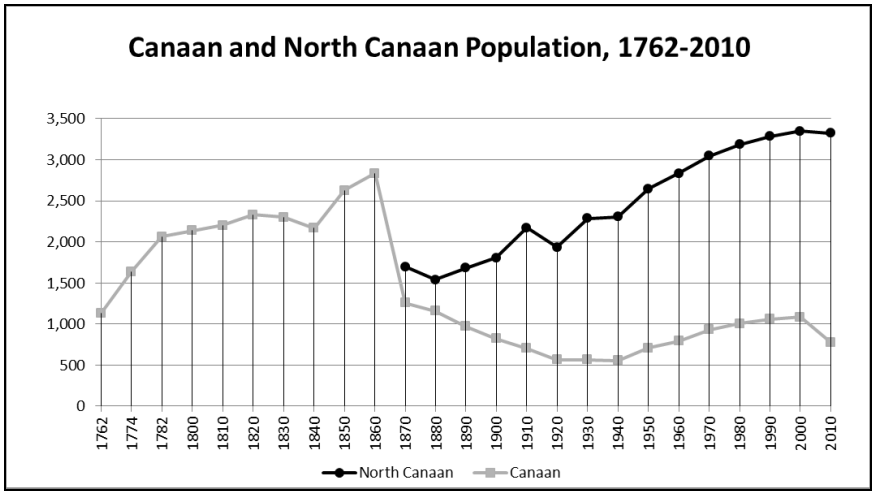
The Colonial Period

As mentioned above, Litchfield County, where North Canaan and its parent town of Canaan are located, was the last area of Connecticut to be laid out into towns and colonized. This was in part because of its remoteness from the major coastal and riverine towns and overall ruggedness, and in part due to a lengthy controversy over ownership of the territory. In 1687, the Colony of Connecticut feared that the new royal governor of all New England and New York, Sir Edmund Andros, would take advantage of his appointment and distribute previously ungranted colony lands to persons outside the control of Connecticut. Their solution was to grant ownership of all the land lying between the Housatonic River on the west, and the towns of Farmington and Simsbury on the east, to the towns of Hartford and Windsor. The area west of the Housatonic was not included because of uncertainty about whether it was within the colony's official boundaries. The validity of this grant was never tested by Andros, as the New England colonies' continued objections to his policies led to his departure in 1689, which the new monarchs, King William and Queen Mary (crowned in 1688), did nothing about. The problems arose when, twenty years later, the town of Hartford began a series of attempts to cement its claim to this large area of land, despite the fact that it was well known that the 1687 measure had been an expedient. The dispute involved half the land in the future Litchfield County; although Hartford and Windsor managed to found the town of Litchfield between 1717 and 1719, after 1719 the colony government forbade any further laying out of land in the so-called "Western Lands" until things were sorted out (Crofut 1937).

Ultimately, the colony government agreed to a compromise that divided the land (less the previously laid out section of Litchfield) between itself and the two towns. In 1729, the colony received the western half and the two towns took the eastern half. In 1732, Windsor and Hartford divided their portion between themselves, and Connecticut laid out five new townships in its half, which became Canaan,

Goshen, Kent, Cornwall, and Norfolk; in addition, Yale College was granted 300 acres in each of the new towns, which it continued to own well into the nineteenth century and even into the twentieth. The method that Connecticut used to distribute the land was a new practice for it: in 1737, it ordered that fifty "rights" in each township were to be auctioned, with an additional three rights withheld as public property for the benefit of the church, the first minister, and the school (Crofut 1937).

The proposed town that would be called Canaan was auctioned at New London in January 1738, and the first meeting of the auction buyers, or proprietors, was held in Wethersfield the next month. These proprietors included men from Groton, Plainfield, Litchfield, Stamford, and Wethersfield, undoubtedly among others. They voted to name the town Canaan and to lay out at least thirty acres to each proprietor in one or two pieces; these initially surveyed lots were to be drawn at random by the proprietors. By June, the first settlers, including the Lawrence and Franklin families, had moved to town, all locating in the portion of town that would later be renamed North Canaan. By 1739, enough of the settlers had moved onto their lots that the legislature incorporated the town and gave it permission to organize a Congregational church society. In accordance with colonial practice, the settlers hired a minister, Elisha Webster, in 1740, and at some point around that time built a meeting house. The division of the town into two ecclesiastical societies, one northern and one southern, was accomplished in 1767; confusingly, however, the legislature designated the southern one as the First Society, and the northern one the Second Society, even though the northern area was settled and churched first (Crofut 1937). The creation of a separate ecclesiastical society was commonly a precursor to the division of a Connecticut town into two municipalities, but that did not happen in Canaan for many years. The whole town had 1,126 inhabitants according to the 1762 census, and 1,635 inhabitants by 1774 (see the population chart below; Keegan 2012).



The colonial farmers of the northwest highlands practiced a mixed agricultural system involving limited animal husbandry (cattle, swine, and sheep) and the cultivation of crops such as grass, rye, Indian corn, oats, buckwheat, flax, beans, peas, and apples, as well as wheat in some better soils. Commerce in the region initially was limited to the export of agricultural products such as flour, salted meat, corn, flaxseed, butter, and cheese, as well as lumber, cattle, and hogs. Imports naturally included delicacies such as sugar, molasses, and tea, and manufactured goods such as cloth, hardware, ceramics, and books. Torrington had three merchants before 1775. Small mills also sprang up as soon as they could be arranged, especially gristmills for grinding grain into flour (sometimes used in place of currency), as well as sawmills for lumber products to be used locally and exported, and fulling mills that finished hand-

woven cloth. Villages sometimes developed around good mill sites. The iron industry of the northwest highlands appeared near the Housatonic River beginning as early as 1732 (Rossano 1997).

The Early National Period, 1780-1850

The need for better transportation was recognized throughout the new State of Connecticut during the opening decades of the nineteenth century, and the first attempt at improving things was the establishment of turnpike roads. Corporations were formed by the General Assembly and granted authority to improve existing roads, build new roads, and charge tolls according to regulated rates for passage on them. Canaan's industrial boom in particular required better roads, and three different companies answered the need and built roads through what would become North Canaan. The Greenwoods Company, incorporated in 1798, built a road from New Hartford, through or near the village of East Canaan, and then north to the Massachusetts line. Finished in 1799, it continued in operation until 1872. The Canaan and Litchfield Turnpike Company was chartered in 1799, and built a road from the Litchfield courthouse to Canaan Village in what is now North Canaan. It continued in operation until 1853, when it was dissolved because of competition from the new railroads. Finally, the Warren Turnpike Company was chartered in 1806, at first running from Warren to Falls Village, and in 1809 being extended to the Massachusetts line. Exactly when it became a free road is unknown, but chances are it was in the 1850s, and for the same reason the Canaan and Litchfield company was dissolved (Wood 1919). The reason for all this activity was that by 1813, the town of Canaan had six iron forges, five in the southern part of the town and one in the north. The northern forge was on the Blackberry River; the same section of river also supported a grist mill and a slitting mill (Warren and Gillett 1813). This was undoubtedly the forge established by Richard Seymour in 1738, later expanded by Samuel Forbes and John Adam into a major enterprise by 1795. During the first half of the nineteenth century, these facilities were expanded to include blast furnaces, offices, worker housing, canals, and other structures (Gordon and Raber 2000).

A gazetteer published in 1819 reported that Canaan was a large and mountainous town, with considerable limestone resources being quarried. It also noted the recent discovery of iron ore in the northeast, which was being mined, though it was reportedly of poor quality. The valleys provided plenty of opportunity for agricultural production, ranging from grains (especially rye and corn, which were exported) to flax, meat, cheese, and butter. There were eight iron forges in the town, seven shops making anchors, and two furnaces for processing iron ore, most of which came from the neighboring town of Salisbury. The town also had a cotton textile mill, a distillery, mills for grinding grain and plaster, four water-powered machines for carding wool, 15 sawmills drawing on the extensive forests on the town's hillsides, and many limekilns for producing lime. The compilers reported 276 dwelling houses in the town, but no clusters of them that might be called villages, and nine general stores supplying the community; in addition to the two Congregational churches, there was one Methodist and, unusually, one Quaker community (Pease and Niles 1819).

In the 1830s, Barber described the businesses enterprises located near the falls of the Housatonic River (now in the current town of Canaan) as including an iron works, a forge, and an anchor shop. Otherwise, the economic activity he noted was limestone quarrying (Barber 1837). It is also known that a large quarry of dolomite (which has many industrial uses, and is often found with limestone) was near the village of East Canaan (Gordon and Raber 2000). As the population chart above shows, the population of Canaan was quite substantial even in the earliest census years, such that it surpassed 2,500 residents in 1850 and 1860, before the town split into North Canaan and Canaan (Keegan 2012). The jump in population that the chart shows after 1840 probably had to do with the construction of the Housatonic Railroad, which was incorporated in 1836; the financial panic of 1837 delayed construction, but it was

completed from Bridgeport to the Massachusetts line in 1842, passing through Falls Village and then across country through Canaan. This railroad was successful for many years, serving passengers and the freight needs of Litchfield County's marble and granite quarries, iron industry, lime production, and porcelain clay operations. In 1892 the Housatonic Railroad was taken over by the New York, New Haven & Hartford Railroad, and during the twentieth century it suffered from the same decline as many other roads, so that it is now largely abandoned (Turner and Jacobus 1989).

The town's population remained homogenous, in religious terms, for many years, but in the 1780s some individuals registered as Baptists exempt from taxes for support of the Congregational church, and in 1792 a Methodist Episcopal Church was organized, building a church in 1793 at a location called Battle Hill, northeast of Falls Village. In 1846, the parish of Christ Church, North Canaan, was founded (Hughes and Allen 1976; J. W. Lewis & Company 1881). When the town divided in 1858, the southern part, though settled later, retained the name of Canaan, while the northern part became North Canaan (Crofut 1937).

Industrial and Urban Growth Period, 1850-1930

The highest population that Canaan has ever seen was in 1860, when the town reported 2,834 residents (for unknown reasons, Canaan and North Canaan were reported together in this census, despite their 1858 divorce). When separate numbers were reported in 1870, Canaan's population had fallen by more than half, to 1,257 inhabitants; North Canaan, in contrast, had 1,695 residents. As the population chart above shows, it was North Canaan that garnered an increasing number of residents after the division, not Canaan, its population rising to an early peak of 2,171 residents, falling to under 2,000 residents in 1920, and then recovering its lost ground by 1930. Canaan's population, in contrast, fell steadily to just over 500 residents by 1930 (Keegan 2012).

In a map of Canaan published in 1853, the northern part of the town contained two named villages, Canaan and East Canaan, with a third village called East Sheffield that lay partly in the Massachusetts town of that name. According to the map, East Canaan was by far the larger village. This map also recorded an absence of buildings with both the project area and the parcels in which it is located, even though it was on the main road between Canaan and East Canaan (Figure 3). This probably has to do with the topography, which features a slope leading up from the road. As of the time of a map published in 1874, the village of Canaan was noticeably larger, and located at the intersection of two railroads. The town hall had moved up to the village, where several churches, at least one hotel, and several businesses were located. The Connecticut Western Railroad passed to the south of the road near the project area, crossing to the north side just to the west of the project area as it approached the village of Canaan. No buildings were marked on the project area's side of the road, although several were shown on the south side of the road and railroad. To the northwest of the proposed Facility, the Peirce & Lawrence Lime Kiln was shown. The town's changing demographics were suggested by the presence of a Roman Catholic church to the west of that (Figure 4; Beers 1874). The Connecticut Western Railroad had been opened in 1871, connecting the northwestern industrial region to Hartford on the east and to the New York railroads on the west. Later leased by and sold to other companies, this road began to be abandoned in the 1930s. By the 1980s, little trace of it remained west of Bloomfield or east of Canaan (Turner and Jacobus 1989:130-134, 142, 153).

Two banks were chartered in North Canaan during the latter part of the nineteenth century, and only one in Canaan. According to the county history, the village of Canaan (located in North Canaan, approximately 1.5 km (1 mile) to the west of the project area) was "a pleasant village, with churches, numerous stores, two hotels, and a newspaper" and commanded a good position on both the

Housatonic and Connecticut Western Railroads (J. W. Lewis & Co. 1881:485). During the mid to late nineteenth century, however, farming became an increasingly uneconomical proposition in Connecticut. Most farmers switched from meat and grains, which could be purchased more cheaply from the Midwest to butter and cheese, which did not travel as well. In the 1880s, refrigerated railroad cars were developed, which allowed the production of fresh milk to become important as well. Overall, however, the farming population fell and marginal lands were abandoned. Towns with industrial activity managed to keep their populations stable, while primarily agricultural places lost population through the 1930s (Rossano 1997). The primary businesses of North Canaan were the iron industry and the dolomitic limestone quarries. Some of the iron furnaces near East Canaan village continued in operation until 1923, changing ownership to the Barnum & Richardson conglomerate in the later nineteenth century. Overall, the declining economy of the region was supplemented to a certain extent in the late nineteenth and early twentieth centuries by the establishment of summer homes and hobby farms by wealthy city dwellers, and camps and cottage rentals for the less well-off, but these temporary visitors were not sufficient to boost the population (Bepler and Bepler 1999; Gordon and Raber 2000). An important non-localized impact of the iron industry before approximately 1860 was deforestation caused by an insatiable demand for charcoal to feed the iron furnaces (Gordon and Raber 2000). In Salisbury and Sharon, where furnaces similar to Canaan's and North Canaan's were in operation, 70 percent of the forested area was owned, rented, or otherwise utilized by iron manufacturers for charcoaling. The Barnum & Richardson Company papers from approximately 1890-1920 indicate that the charcoal supply had dwindled to the point that they had to import anthracite coal from Pennsylvania to operate their furnaces (Gordon and Raber 2000).

Modern Period, 1930-Present

The town's principal industries in 1932 were agriculture, the manufacture of lime, marble quarrying, and lumbering (Connecticut 1932). The survival of these industries into the 1930s helps to explain the growth of the town's population to that time; although it was slow growth, the 1930 population of North Canaan was 2,287 (Keegan 2012). The number of farms in the region continued to fall through the twentieth century, but because of suburbanization, a result of the rise of the automobile, the population of many towns began to grow again (Rossano 1997). The population chart above shows that North Canaan's population increased steadily between 1940 and 2000, peaking at 3,350 residents before declining slightly to 3,323 residents as of 2010. Canaan, in contrast, saw much more modest growth during the same period, peaking at 1,081 residents in 2000 before also declining (Keegan 2012). Summer visitors continued to be a source of income to some property owners in the region (Bepler and Bepler 1999). Consistent with the general trend in the region, only 3 percent of the town's residents were employed in agriculture in 2005, with another 6.8 percent in mining; unusually, 40.4 percent of employment was in manufacturing, while 47.2 percent was in commercial enterprises. A clear majority of residents worked in the town (CERC 2007). Nonetheless, Canaan was still a very rural town in 2007; only 27 of the state's 169 towns were smaller than it in 1990 (Keegan 2012).

The town's 2006 plan of conservation and development reported a breakdown of the use of developed land as follows: Residential, 61.41 percent; Commercial, 14.27 percent; Industrial, 11.37 percent (a very large increase since 1972); Agriculture, 7.6 percent (down slightly from 1972). The plan suggested encouraging commercial and industrial growth in certain areas, and noted an increase in graveling operations. The plan's map designated the project area parcels as a mix of developable and agricultural land (North Canaan 2006). The 1934 aerial photograph series shows that both the project area and the project area parcels were mostly agricultural fields, despite the topography. Parts of the parcels were also forested or reforesting. The general area was also a mix of fields, pasture, and reforesting land. To the northwest of the project area, a limestone processing operation was still active at the same site

shown in the nineteenth-century maps. Residential development had advanced eastward along East Main Street, and two residences had been built in the cutout along the southern edge of the project area parcels. The old Connecticut Western Railroad still crossed the road on a bridge, and may have still been active at this time (Figure 5; Fairchild 1934).

According to a 1949 topographic map, the section of railroad to the south of the project area had been abandoned thoroughly enough that it was omitted from the map. The section to the west, however, was still present, and served a large new factory complex. No cultural features were noted within the project area or the project area parcels, although the two houses from the earlier aerial photograph were still present (Figure 6, USGS 1949). The 1951 aerial photograph confirms the absence of new cultural features within the project area parcels. The former agricultural fields within the parcels were in various stages of reforestation, as were many, though not all, fields in the vicinity (Figure 6; USDA 1951). As of 1969, an aerial photograph shows that all of the former agricultural fields within the project area parcels had been completely reforested. Another new building had been constructed near the project area's southern edge. No cultural features were visible within the project area proper, however. Little other residential development had occurred in the vicinity of the project area (Figure 8, USGS 1969). Fifty years later, in 2019, a substantial portion of the project area parcels had been cleared again, and a small house and larger vehicle or work shed built on them. The project area proper, however, remained forested. Although the amount of housing in the vicinity had increased somewhat, the neighborhood was still largely rural, dominated by agricultural fields and forest. To the northwest, however, the large industrial building and the railroad were still operating. The visible layer of white dust indicates that the business was processing limestone, as had been done in the town for centuries at that point (Figure 7; CT ECO 2019). This imagery and the population trends suggest that the town's earlier population growth established most new residences in other parts of the town.

Conclusions

The documentary record indicates that it is highly unlikely that any significant historical resources are present in the project area. Most buildings constructed during the historic period were placed in other areas to the east and west, and were closer to the road than the project area's location. The possible exceptions are two buildings located on the road to the south of the project area that appeared in the 1934 aerial photograph, and are within 152 m (500 ft) of it. These may be of late nineteenth (post-1874) or early twentieth (pre-1934) construction. Nonetheless, they are far enough away from the project area that historic resources associated with them are unlikely. There may be stone walls or fencing still present in the woods of the project area, but this evidence of past farming activity is not considered historically significant.

CHAPTER V
PREVIOUS INVESTIGATIONS

Introduction

This chapter presents an overview of previous archaeological research completed within the vicinity of the proposed Facility in North Canaan, Connecticut. This discussion provides the comparative data necessary for assessing the results of the current Phase IA cultural resources assessment survey, and it ensures that the potential impacts to all previously recorded cultural resources located within and adjacent to the project area are taken into consideration. Specifically, this chapter reviews previously identified archaeological sites and National/State Register of Historic Places properties situated in the project region (Figures 10 and 11). The discussions presented below are based on information currently on file at the Connecticut State Historic Preservation Office in Hartford, Connecticut. In addition, the electronic site files maintained by Heritage also were examined during the course of this investigation. Both the quantity and quality of the information contained in the original cultural resources survey reports and State of Connecticut archaeological site forms are reflected below.

Previously Recorded Archaeological Sites, National/State Register of Historic Places Properties/Districts in the Vicinity of the Project Area

A review of data currently on file at the Connecticut State Historic Preservation Office, as well as the electronic site files maintained by Heritage identified 12 archaeological sites situated within 1.6 km (1 mi) of the project area (Figure 10). These included Sites 100-2A, 100-2B, 100-3A, 100-3B, 100-5A, 100-5B, 100-6, 100-7, 100-8, 100-66, 100-71, and 100-72. In addition, two National Register of Historic Places districts (Canaan Village Historic District and the Samuel Forbes Homestead), two individually-listed National Register of Historic Places properties (Union Depot and the Isaac Lawrence House), and three State Register of Historic Properties (Canaan Railroad Station, the Captain Isaac Lawrence House, and the Colonel Joseph Peet House) were also identified within 1.6 km (1 mi) of the Facility (Figure 11). These resources are described below.

Site 100-2A

Site 100-2A is the prehistoric component of the Lyle I Site, which was identified off of High Street in North Canaan within a proposed sewer line corridor (Figure 10). The site covers approximately 1 acre of land to the west of Blackberry River. The American Indian Archaeological Institute (AIAI) tested and recorded the site in 1979. AIAI staff recorded "fluvial geology" within the site area that suggested "deeply buried sediments likely to yield a prehistoric site." No artifacts were recovered. Site 100-2A was not assessed applying the qualities of significance as defined by the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). Site 100-2A is located is far enough to the west that it will not be impacted by the proposed Facility.

Site 100-2B

Site 100-2B is the historical component of the Lyle I Site, which also was identified off of High Street in North Canaan, as described above (Figure 10). The AIAI tested and recorded the historical component of this site in 1979 and reported the recovery of decal decorated white earthenware, glass, and brick fragments within fill soils. This historical component of Site 100-2B was not assessed applying the qualities of significance as defined by the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]), and it was determined that additional more excavation would be needed to make the

assessment. As mentioned above, this site is situated far enough to the west of the proposed Facility that it will not be impacted by construction.

Site 100-3A

Site 100-3A is the prehistoric component of the Lyle II Site recorded by the AIAI in 1979. It is also located off of High Street in North Canaan; it is bordered on the west by the Blackberry River and covers approximately 1 acre of land (Figure 10). Archaeological testing took place preceding construction of a sewer line and resulted in the recovery of chert flakes representing a "fairly great" concentration related to a camp site. Site 100-3A was not assessed applying the qualities of significance as defined by the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). Site 100-3A is situated well to the west of the proposed Facility and it will not be impacted by construction.

Site 100-3B

Site 100-3B is the historical component of the Lyle II Site, which was recorded by AIAI staff in 1979. It is located off of High Street in North Canaan, as described above, and covers approximately 1 acre of land (Figure 10). Archaeological testing to the west of the Old Lantern Tavern resulted in the identification of a midden that yielded cut nails and black transfer printed earthenware. A second midden was identified within the floodplain of Blackberry River, as well, and it yielded brick fragments, glass shards, and undecorated porcelain sherds within an ash layer. The tavern was used from the eighteenth through the twentieth century. This site was not assessed applying the qualities of significance as defined by the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]), and it will not be impacted by the proposed solar facility.

Site 100-5A

Site 100-5A is the prehistoric component of the Dead Exxon II Site, which was recorded by the AIAI in 1979. It is located to the north of Route 7 in North Canaan and within Robbins Swamp; it was identified during survey of a proposed sewer line (Figure 10). The site covers approximately 2.5 acres of land. Archaeological testing resulted in the recovery of chert flakes, indicating an upland camp site from an unknown time period. Site 100-5A was not assessed applying the qualities of significance as defined by the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). This site is located far enough to the southwest of the Facility that it will not be impacted by construction.

Site 100-5B

Site 100-5B is the historical component of the Dead Exxon II Site. It is located north of Route 7 in North Canaan as described above (Figure 10). Archaeological testing of this portion of the site resulted in the recovery of cut nails and brick fragments representative of a nineteenth century secondary refuse deposit that was not associated with any structural remains. Site 100-5B was not assessed applying the qualities of significance as defined by the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). It will not be impacted by construction of the proposed Facility.

Site 100-6

Site 100-6 was recorded by AIAI in 1979 and named the Hagadone I Site. AIAI tested the site area, which encompasses a 90 x 10-meter area, preceding the construction of a sewer line. Site 100-6 is located along Lower Road in North Canaan and to the west of Blackberry River (Figure 10). No artifacts were recovered during testing, but a head race associated with a nineteenth century power canal was identified; it once powered a sash and blind factory and sawmill. Site 100-6 has not been assessed applying the qualities of significance as defined by the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). It will not be impacted by construction of the proposed Facility.

Site 100-7

Site 100-7 was recorded by AIAI in 1979 following testing of a proposed sewer line in North Canaan. The site is named the Gangi I Site and is located to the north of Route 7 within a 100 x 10 meter area (Figure 10). AIAI describes the site as "The head race for a canal that powered a sash and blind factory and sawmill." No artifacts were recovered, and Site 100-7 has not been assessed applying the qualities of significance as defined by the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). It will not be impacted by construction of the proposed Facility.

Site 100-8

Site 100-8 is the Dead Exxon III Site, which was recorded by George Nicholas of the AIAI in May 1985. The site was surface collected by Nicholas on July 12, 1983 when he recovered one chert piece esquillee and chert soft percussion thinning flakes. Site 100-8 is located on a late Pleistocene-early Holocene alluvial terrace east of a railroad bank that is situated 140 meters south of the Blackberry River crossing (Figure 10). It covers approximately five square acres of land. Site 100-7 was determined to be a prehistoric camp site, but it has not been assessed applying the qualities of significance as defined by the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). It will not be impacted by the proposed construction due to distance from the proposed Facility area.

Site 100-66

Site 100-66 was recorded as the Elm Knoll II Site by George Nicholas of the AIAI in May 1985. Nicholas surface collected the site on June 18, 1984 and recovered a single chert hard percussion thinning or shaping flake and one quartz flake or blank. He wrote that this camp site "is located on Late Pleistocene-Early Holocene-aged landform above the Blackberry, south of its confluence with the Whiting." Site 100-66 is situated within the northwest corner of the field on a terrace on the north side of Blackberry Brook in Elm Knoll Farm south of Route 44 in North Canaan (Figure 10). It measures at least four square meters in size. Site 100-66 has not been assessed applying the qualities of significance as defined by the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). It will not be impacted by the proposed construction due to distance from the proposed Facility area.

Site 100-71

Site 100-71 is located in a cornfield between Lower Road and Route 44 in North Canaan on a Middle Holocene terrace above Blackberry River (Figure 10). It is named the Foley 10 Site and was recovered in June 1985 by George Nicholas from the AIAI. Mr. John Feathers surface collected from the site, but his findings are not recorded on the Site 100-71 site form. The site form suggests that Site 100-71 is a possible prehistoric camp site with depositional integrity ranging from fair to good. It has not been assessed applying the qualities of significance as defined by the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). Site 100-71 will not be impacted by the proposed construction due to distance from the proposed Facility area.

Site 100-72

Site 100-72, also known as the Dealey I (Dealey Hole) Site, is located in a cornfield between Lower Road and Route 44 in North Canaan on the upper floodplain of the Blackberry River (Figure 10). George Nicholas from AIAI recorded Site 100-72 in June of 1985 following surface collection by Mr. John Feathers and other collectors. These collectors recovered several miscellaneous prehistoric artifacts, all of which were unspecified on the Site 100-72 site form. The size, use, and age of Site 100-72 are unknown and the site has not been assessed applying the qualities of significance as defined by the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). Site 100-72 will not be impacted by construction of the proposed Facility.

Canaan Village Historic District

The Canaan Village Historic District is bounded by Granite Avenue, West Main Street, Main Street, and Bragg Street in North Canaan (Figure 11). It was nominated to the National Register of Historic Places by Mary E. McCahon of the Falls Village-Canaan Historical Society in March 1990 for significance in the areas of architecture and transportation between 1836 and 1940. The district contains 93 acres of land and 235 resources within a commercial center of North Canaan. Resources includes 59 dwellings built before 1900, 48 dwellings built between 1900 and 1935, and 12 dwellings built after 1935. In addition, there are 80 outbuildings or ancillary buildings, one structure, five ecclesiastical buildings, and three railroad-related resources within the district. A total of 38 of the resources are considered non-contributing elements, including 19 modern garages or cottages. Residential architectural styles in the district include Greek Revival, Italianate, Queen Anne, and Colonial Revival. The Pilgrim Congregational Church displays Shingle Style architecture, and the Episcopal chapel the Gothic Revival style. Commercial buildings, concentrated at the center of the district, combine brick and frame blocks and many hold millwork or pressed metal details. Railroad tracks traverse the district from south to north, with a station on Main Street (see Union Depot below). Railroad construction in this area was spurred by the success of local lime, iron, and dairy industry and made this district a regional transfer point for the export of these products. Quicklime production after 1860 further influenced the growth of Canaan Village and brought new commercial and residential construction. The Canaan Village Historic District will not be impacted by construction of the proposed Facility as it is located nearly 1,000 m (3,280 ft) to the southeast and there is intervening vegetation and topography between it and the historic district.

Union Depot

Union Depot is located within the Canaan Village Historic District described above (Figure 11). The depot was individually listed on the National Register of Historic Places on December 7, 1971 by Susan Babbitt of the Connecticut Historical Commission. Located on Main Street, the depot was built by the Housatonic and Connecticut Western Railroads in 1872. The building, which is composed of two stories and two 90-foot-long wings, contains platforms, boarding rooms, and a lunch room. A central tower once contained accommodations for telegraph operators. The depot has a hipped roof, bracketed eaves with drops, board and batten siding, and an arched entrance. Passenger service at the Union depot ended in April 1971 when it became a freight depot. Union Depot will not be impacted by the proposed Facility due to the distance and intervening vegetation and topography between the two areas.

Samuel Forbes Homestead

The Samuel Forbes Homestead is located at 89 Lower Road in North Canaan (Figure 11). It was listed on the National Register of Historic Places in June 1992 by Architectural Historian David F. Ransom for its architectural and industrial significance. The building itself is a Colonial residence with a gable roof, two stories, clapboard siding, and a five-bay facade with central entrance. Construction date is approximately 1754 and there are Victorian-era and Colonial Revival alterations. The house sits on 27 acres which also contain a barn, shed, chicken coop, abandoned barn, and greenhouse. Samuel Forbes, the original owner, was a renowned iron worker and ironmaster. Forbes had trained as a blacksmith under his father, who had come to North Canaan in the early 1740s from Simsbury. After personal ironworking success, Samuel Forbes eventually partnered with his son-in-law John Adam Jr., to form Forbes & Adam, producers of heavy iron forgings. Their most popular products were ship anchors, steamboat irons, augurs for boring cannon, bellows pipe, blacksmiths' raw material, chains, grappling irons, hoops and bands, plow plates, salt-evaporation pans, and saws. Forbes died in 1829 and his house remained in Forbes family ownership until 1955. The cemetery where the Forbes family is interred is located just west of the homestead. None of the resources associated with the Samuel Forbes

Homestead will be impacted by the proposed Facility due to distance, as well as intervening vegetation and topography.

Isaac Lawrance House

The Isaac Lawrance House or Lawrance Tavern was listed on the National Register of Historic Places by Bruce Clouette on July 25, 1982 for significance in the areas of historical archaeology, architecture, exploration/settlement, and local history. The building is located on Elm Street in North Canaan surrounded by six acres of lawn and meadows (Figure 11). A frame barn and modern shed are positioned to the rear of the house. The house was built in 1751; it stands 2.5 stories tall and has a gable roof with asphalt shingles, a center chimney, five-bays with a central entrance, a pedimented porch with Classical frieze, pilasters, clapboard siding, and a fieldstone foundation. A doorstep before the front entrance is inscribed "Isaac Lawrance / Came here June 2 1738 / This House Built / 1751 / ISAAC LAWRANCE died Dec 2 1793 / Lydia Hewit his wife died Nov 11 1767 aged 60" and with a list of their children's names. Isaac arrived in North Canaan in 1738, and his family was among the first settlers of the town. Isaac's home became an early tavern and meeting place and he also farmed the surrounding 60 acres. Other uses for the building included a school in the mid-nineteenth century and a later boarding school. Lawrance family members owned the property to the time it was nominated to the National Register. Archaeological excavations took place south of the house in 1979 and 1980 and resulted in the recovery of ceramics, glass, nails, brass lamp parts, a bone toothbrush, and butchered animal bones from between 1750 and 1850. The Isaac Lawrance House will not be impacted by the proposed Facility due to distance from the proposed Facility and intervening vegetation and topography between the two areas.

Canaan Railroad Station

The Canaan Railroad Station was listed on the State Register of Historic Places by John Beringer and Henry Simon of the Connecticut Historical Commission on July 13, 1966. It is located below Route 7 at the junction of two railroad lines in North Canaan (Figure 11). The station was built circa 1875 and is of frame and iron construction. It contains features of eclectic architectural style with many considered to be "Norman" Victorian details. The building has two two-story ells meeting at a right angle. Where they meet there is an octagonal tower that is a full story taller than the main building. The Canaan Railroad Station will not be impacted by the proposed Facility due to distance from the proposed Facility and intervening vegetation and topography between the two areas.

Captain Isaac Lawrence House

The Captain Isaac Lawrance House was built in 1751 in the Colonial style as a farmhouse for Isaac Lawrence. It has two stories, a gable roof, a central chimney, five bays, and twelve-over-twelve sash windows all typical of the style. The house is located at the southwest corner of Route 7 and Elm Street in North Canaan (Figure 11). John Beringer and Henry Simon of the Connecticut Historical Commission recorded the house as a State Register of Historic Places property on July 13, 1966. It will not be impacted by the proposed Facility due to distance from the proposed Facility and intervening vegetation and topography between the two areas.

Colonel Joseph Peet House

The Colonel Joseph Peet House is located on the southwest corner of Route 7 and Church Terrace in North Canaan (Figure 11). It was listed on the State Register of Historic Places on July 13, 1966 by John Beringer and Henry Simon of the Connecticut Historical Commission. The residence was built for Joseph Peet in 1821 in the Federal style. Features include a full Ionic portico over the main entrance which has decorative pilasters and entablature, Georgian brackets in the cornice, and an elliptical fan in the gable

end. The Colonel Joseph Peet House will not be impacted by the proposed Facility due to distance from the proposed Facility and intervening vegetation and topography between the two areas.

Summary and Interpretations

The review of previously identified cultural resources in the vicinity of the proposed Facility indicates that the larger project region contains numerous prehistoric and historical cultural resources related to Native American habitation and resource extraction, colonial farming, and the local iron, lime, and dairy industries of North Canaan's history. None of the previously identified cultural resources sites will be impacted by the proposed Facility either directly or indirectly.

CHAPTER VI
METHODS

Introduction

This chapter describes the research design and field methodology used to complete the Phase IA cultural resources assessment survey of the impact areas associated with the proposed facility in North Canaan, Connecticut. The following tasks were completed during this investigation: 1) study of the region's prehistory, history, and natural setting, as presented in Chapters II through IV; 2) a literature search to identify and discuss previously recorded cultural resources in project region; 3) a review of historical maps, topographic quadrangles, and aerial imagery depicting the impact areas in order to identify potential historical resources and/or areas of past disturbance; and 4) pedestrian survey and photo-documentation of the impact areas in order to determine their archaeological sensitivity. These methods are in keeping with those required by the Connecticut State Historic Preservation Office in the document entitled *Environmental Review Primer for Connecticut's Archaeological Resources* (Poirier 1987).

Research Framework

The current Phase IA cultural resources assessment survey was designed to identify assess the archaeological sensitivity of the proposed impact areas, as well as to visually examine them for evidence of any previously unidentified cultural resources during pedestrian survey. The undertaking was comprehensive in nature, and project planning considered the distribution of previously recorded cultural resources located within the region, as well as a visual assessment of the impact areas. The methods used to complete this investigation were designed to provide coverage of all portions of the impact areas. The fieldwork portion of this undertaking entailed pedestrian survey, photo-documentation, and mapping (see below).

Archival Research & Literature Review

Background research for this project included a review of a variety of historical maps depicting the proposed Facility; an examination of USGS 7.5' series topographic quadrangles; an examination aerial images dating from 1934 through 2019; and a review of all archaeological sites and National and State Register of Historic Places on file with the CT-SHPO, as well as electronic cultural resources data maintained by Heritage. The intent of this review was to identify all previously recorded cultural resources situated within and immediately adjacent to the Facility area, and to provide a natural and cultural context for the project region. This information then was used to develop the archaeological context of the impact areas associated with the proposed Facility, and to assess their sensitivity with respect to the potential for producing intact cultural resources.

Background research materials, including historical maps, aerial imagery, and information related to previous archaeological investigations, were gathered from the CT-SHPO. Finally, electronic databases and Geographic Information System files maintained by Heritage were employed during the course of this project, and they provided valuable data related to the project region, as well as data concerning previously identified archaeological sites and National and State Register of Historic Places properties within the general vicinity of the proposed Facility.

Field Methodology and Data Synthesis

Heritage also performed fieldwork for the Phase IA cultural resources assessment survey of the impact areas associated with the proposed facility in North Canaan, Connecticut. This included pedestrian

survey, photo-documentation, and mapping of the impact areas. During the completion of the pedestrian survey, representatives from Heritage photo-documented all potential areas of impact using digital media.

CHAPTER VII
RESULTS & MANAGEMENT RECOMMENDATIONS

Introduction

This chapter presents the results of the Phase IA cultural resources assessment survey of the proposed Facility in North Canaan, Connecticut. As stated in the introductory section of this report, the goals of the investigation included completion of the following tasks: 1) a contextual overview of the region's prehistory, history, and natural setting (e.g., soils, ecology, hydrology, etc.); 2) a literature search to identify and discuss previously completed cultural resources surveys and previously recorded cultural resources in the project region; 3) a review of readily available historical maps and aerial imagery depicting the impact areas in order to identify potential historical resources and/or areas of past disturbance; and 4) pedestrian survey and photo-documentation of the project items in order to determine their archaeological sensitivity.

Results of Phase IA Survey

Heritage personnel conducted pedestrian survey of the impact areas associate with the proposed Facility in early March of 2021. Pedestrian survey was supplemented by mapping and photo-documentation of the impact areas. The development locations associated with the Facility are depicted Photos 1 through 13. As seen in the photos, the area was characterized by uneven topography and steep slopes. Elevations in the region containing the impact areas range from 76.2 m (250 ft) to above 152.4 m (500 ft) NGVD, with the maximum elevation reaching 213.4 m (700 ft) (Dowhan and Craig 1976:41). The predominant soil types located noted throughout the Facility are Charlton, Chatfield, and Stockbridge soils, which are generally correlated with prehistoric site location.

Overall Sensitivity of the Proposed Project Area

The field data associated with soils, slopes, aspect, distance to water, and previous disturbance collected during the pedestrian survey and presented above was used in conjunction with the analysis of historical maps, aerial images, and data regarding previously identified archaeological sites and National and State Register of Historic Places properties, and inventoried historic standing structures to stratify the project items into zones of no/low, moderate, and/or high archaeological sensitivity. In general, historical period archaeological sites are relatively easy to identify on the current landscape because the features associated with them tend to be relatively permanent constructions that extend above the ground surface (i.e., stone foundations, pens, wells, privies, etc.). Archaeological sites dating from the prehistoric era, on the other hand, are less often identified during pedestrian survey because they are buried, and predicting their locations relies more on the analysis and interpretation of environmental factors that would have informed Native American site choices.

With respect to the potential for identifying prehistoric archaeological sites, the project area was divided into areas of no/low, moderate, and/or high archaeological potential by analyzing the landform types, slope, aspect, soils contained within them, and their distance to water. In general, areas located less than 300 m (1,000 ft) from a freshwater source and that contain slopes of less than 8 percent and well-drained soils possess a high potential for producing prehistoric archaeological deposits. Those areas located between 300 and 600 m (1,000 and 2,000 ft) from a freshwater source and well drained soils are considered moderate probability areas. This is in keeping with broadly based interpretations of prehistoric settlement and subsistence models that are supported by decades of previous archaeological research throughout the region. It is also expected that there may be variability of prehistoric site types

found in the moderate/high sensitivity zones. For example, large Woodland period village sites and Archaic period seasonal camps may be expected along large river floodplains and near stream/river confluences, while smaller temporary or task specific sites may be expected on level areas with well-drained soils that are situated more than 300 m (1,000 ft) but less than 600 m (2,000 ft) from a water source. Finally, steeply sloping areas, poorly drained soils, or areas of previous disturbance are generally deemed to retain a no/low archaeological sensitivity with respect to their potential to contain prehistoric archaeological sites.

In addition, the potential for a given area to yield evidence of historical period archaeological deposits is based not only the above-defined landscape features but also on the presence or absence of previously identified historical period archaeological resources as identified during previous archaeological surveys, recorded on historical period maps, or captured in aerial images of the region under study. In this case, proposed project items that are situated within 100 m (328 ft) of a previously identified historical period archaeological site, a National or State Register of Historic Places district/individually listed property, or an area that contains known historical period buildings also may be deemed to retain a moderate/high archaeological sensitivity. In contrast, those areas situated over 100 m (328 ft) from any of the above-referenced properties would be considered to retain a no/low historical period archaeological sensitivity.

The combined review of historical maps, aerial images, land deeds, and pedestrian survey, indicates that the northern impact area and the southern impact area both contain steep slopes and evidence of land clearing, including the grubbing of tree roots and large boulders. Soils found throughout these areas are mainly attributed to the Charlton, Chatfield, and Stockbridge loams that generally extend to 165 cm (65 in), 76 cm (30 in), and 65 cm (26 in) below surface, respectively. Although these soil types have been correlated with both historical and Pre-Contact Native American land settlements, it was clear during pedestrian survey that the two impact areas had been disturbed in the past and are characterized by strong slopes. They possess little, it any archaeological sensitivity.

Management Recommendations

In sum, the Phase IA cultural resources assessment survey, which included the review of historical maps, aerial images, land deeds, and pedestrian survey of the impact areas associated with the proposed Facility, indicate that they retain little, if any, potential to yield intact archaeological deposits. Both areas are characterized by steep slopes and land impacts associated with recent clearing and tree grubbing activity. No additional archaeological examination is recommended prior to construction of the proposed Facility.

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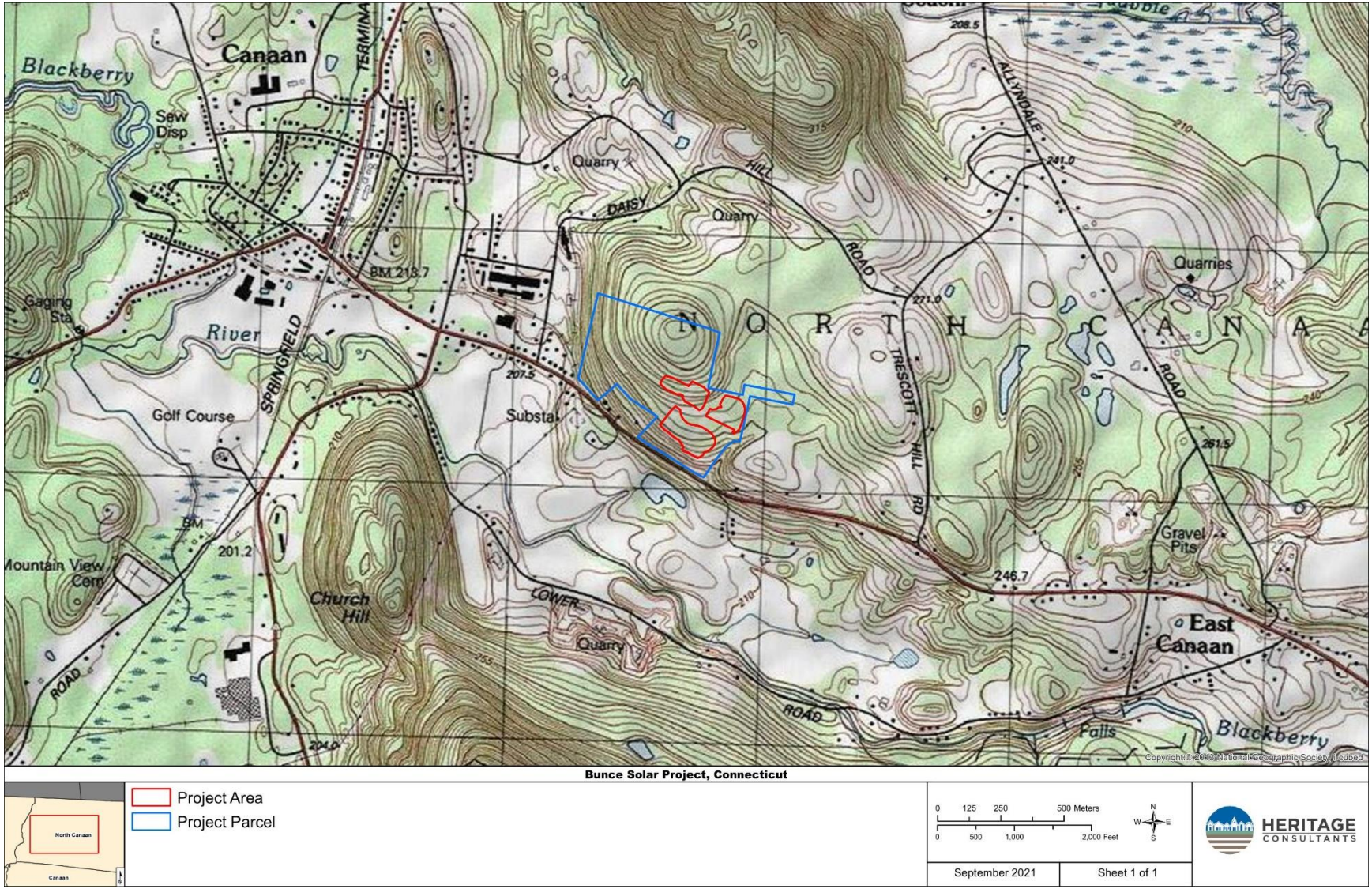

Figure 1. Excerpt from a USGS 7.5' series topographic quadrangle image showing the location of the project area in North Canaan, Connecticut.

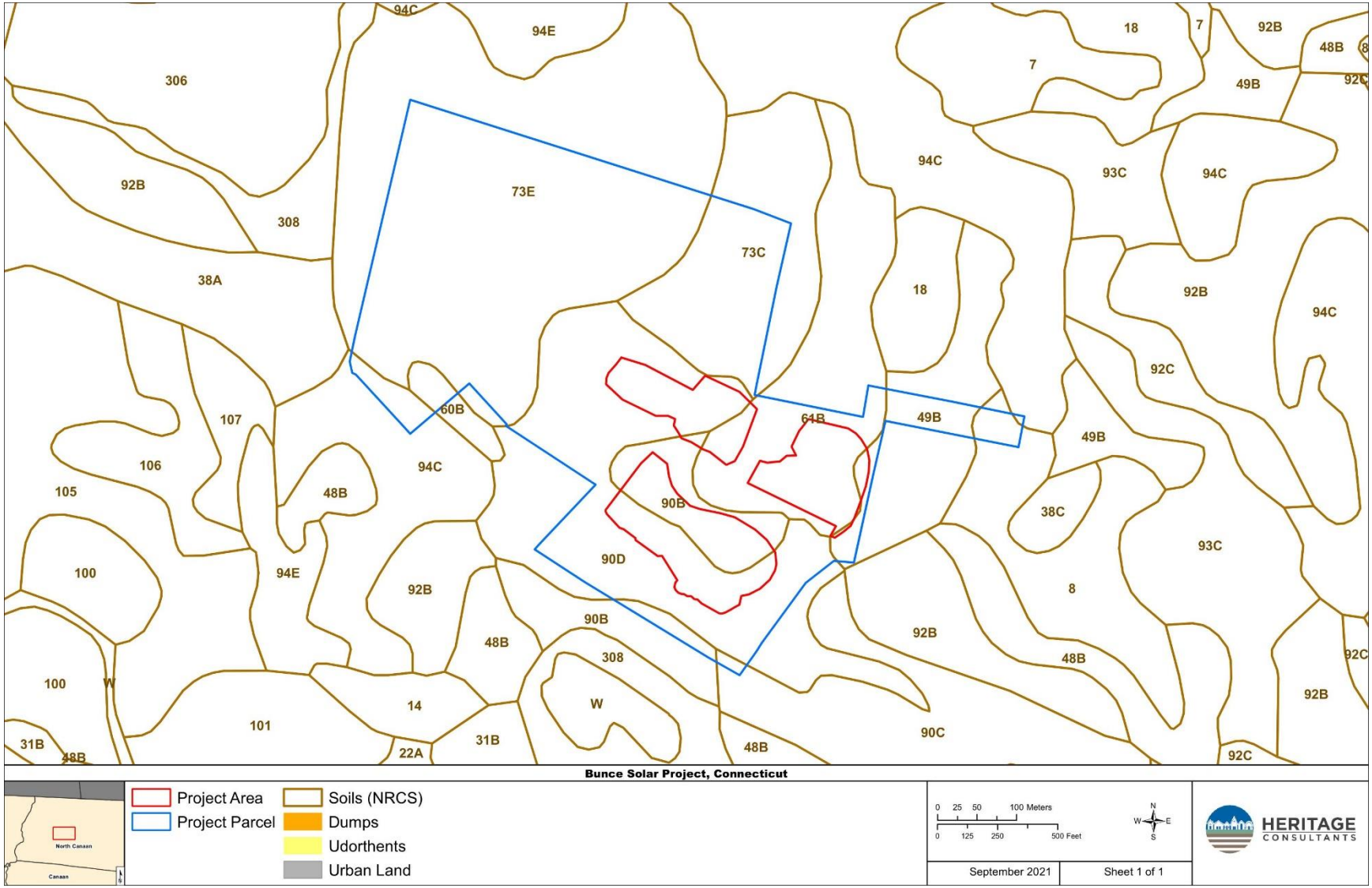

Figure 2. Map of soils located in the vicinity of the project area in North Canaan, Connecticut.

Figure 3. Excerpt from an 1853 historic map showing the location of the project area in North Canaan, Connecticut.

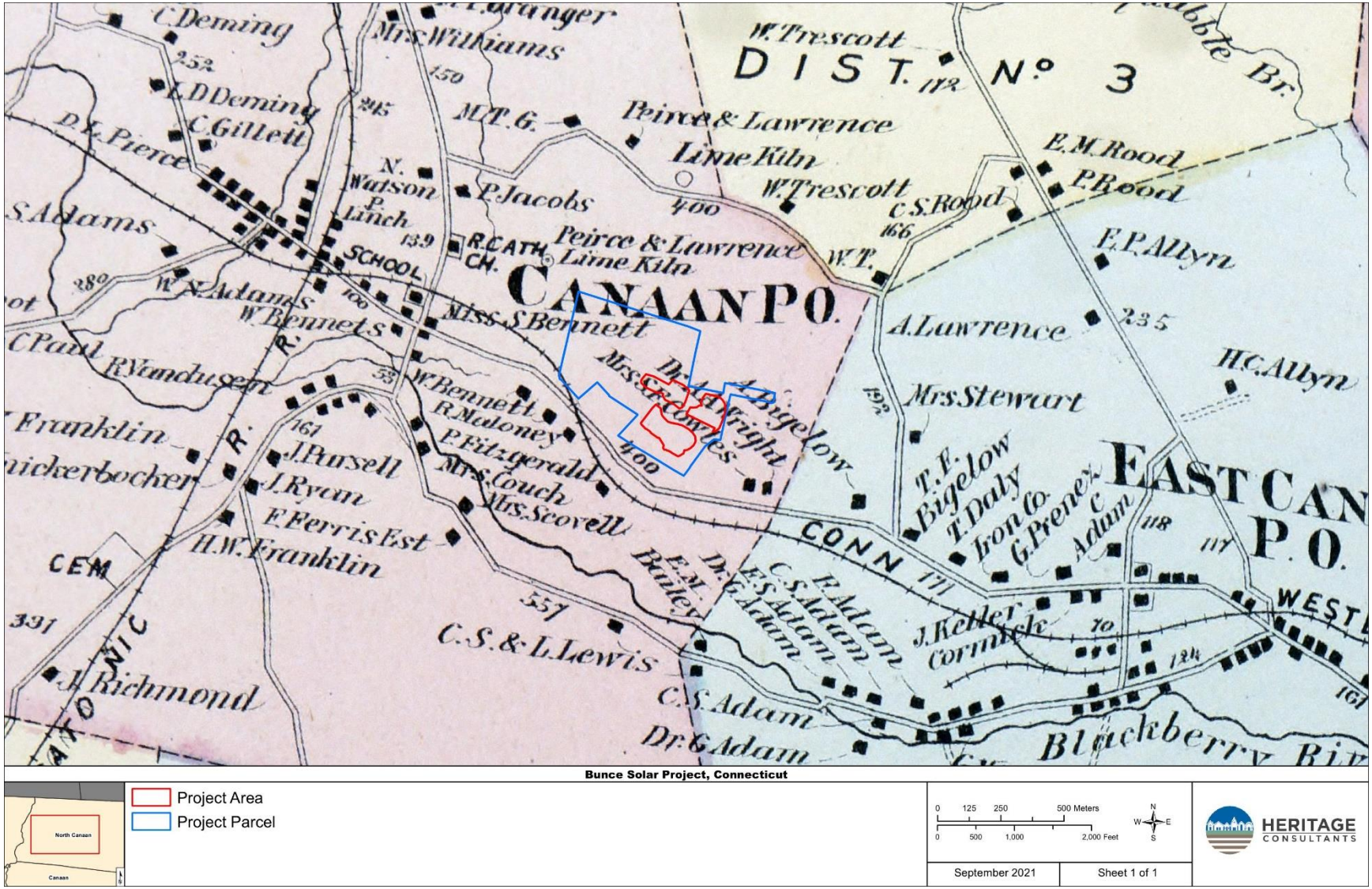

Figure 4. Excerpt from an 1874 historic map showing the location of the project area in North Canaan, Connecticut.

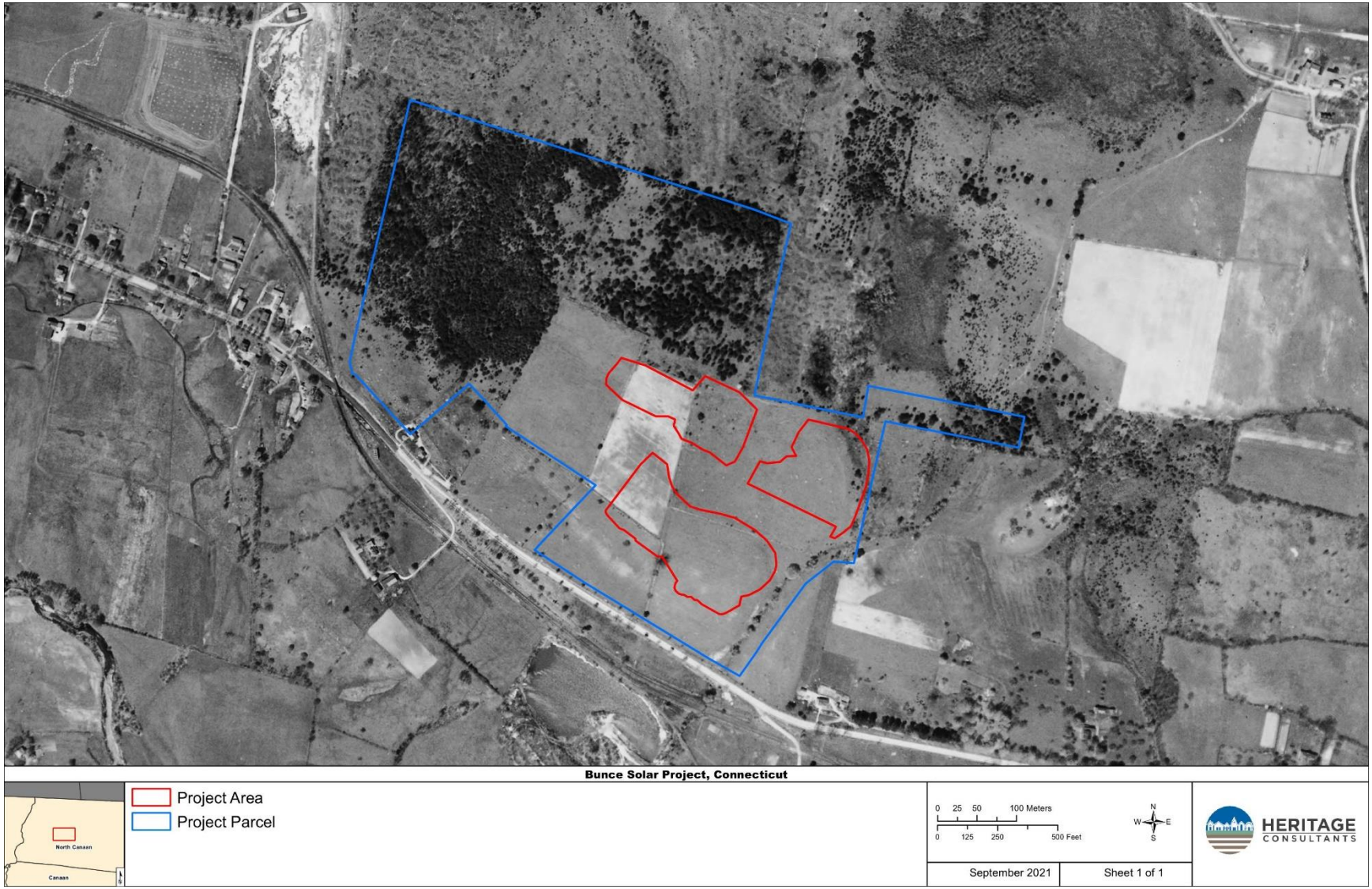

Figure 5. Excerpt from a 1934 aerial photograph showing the location of the project area in North Canaan, Connecticut.

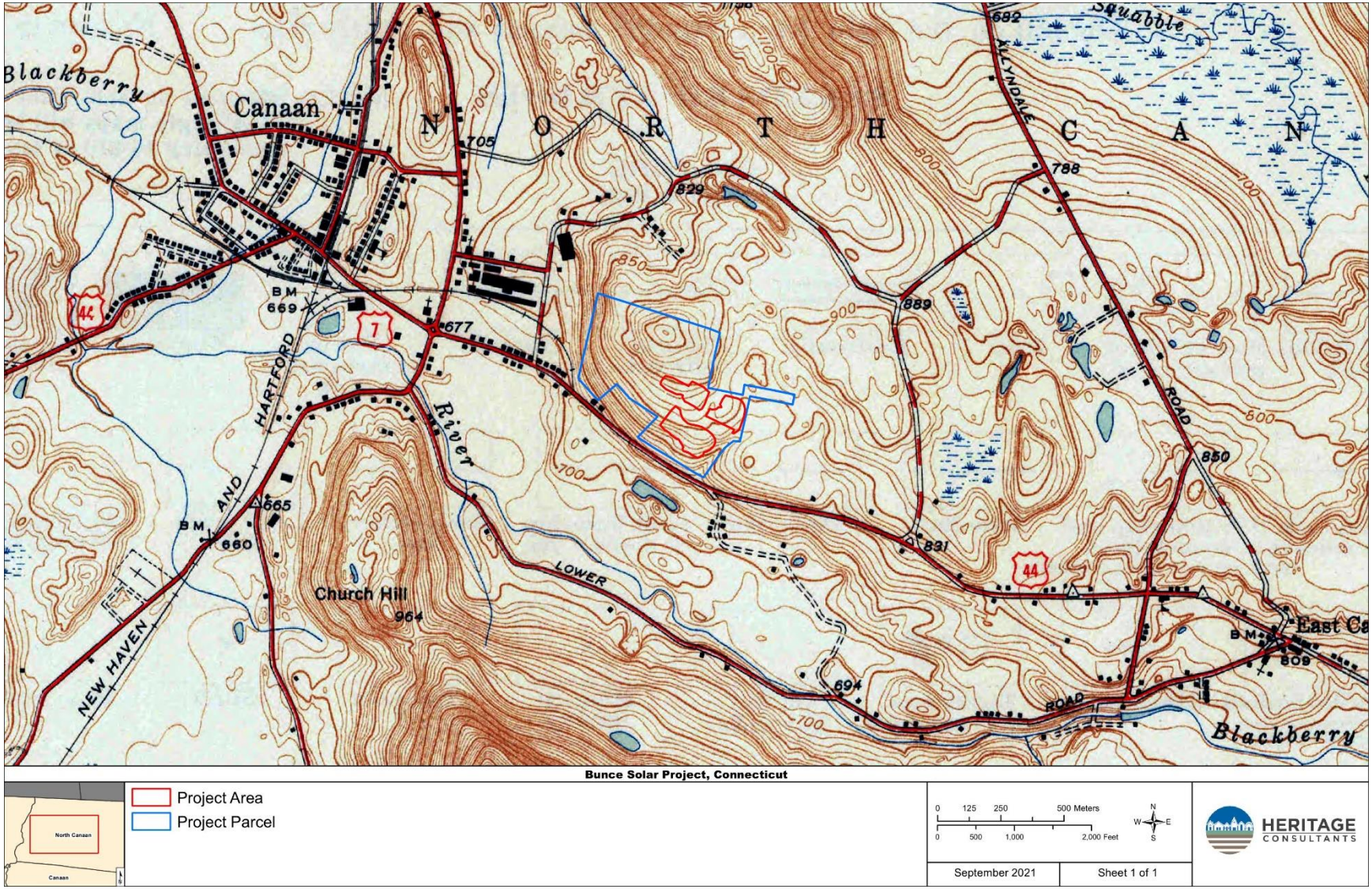

Figure 6. Excerpt from a 1949 Quad Map showing the location of the project area in North Canaan, Connecticut.

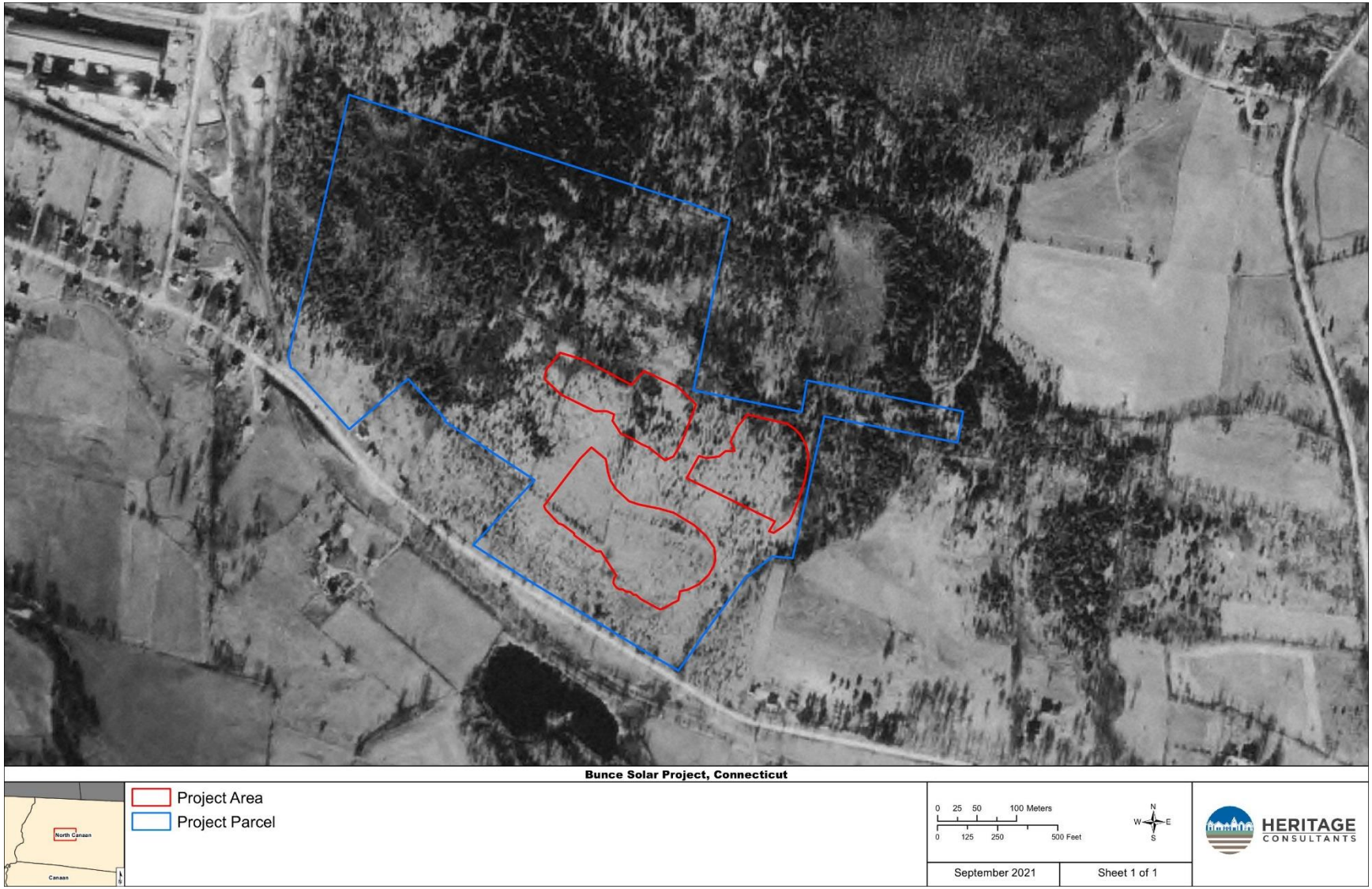

Figure 7. Excerpt from a 1951 aerial photograph showing the location of the project area in North Canaan, Connecticut.

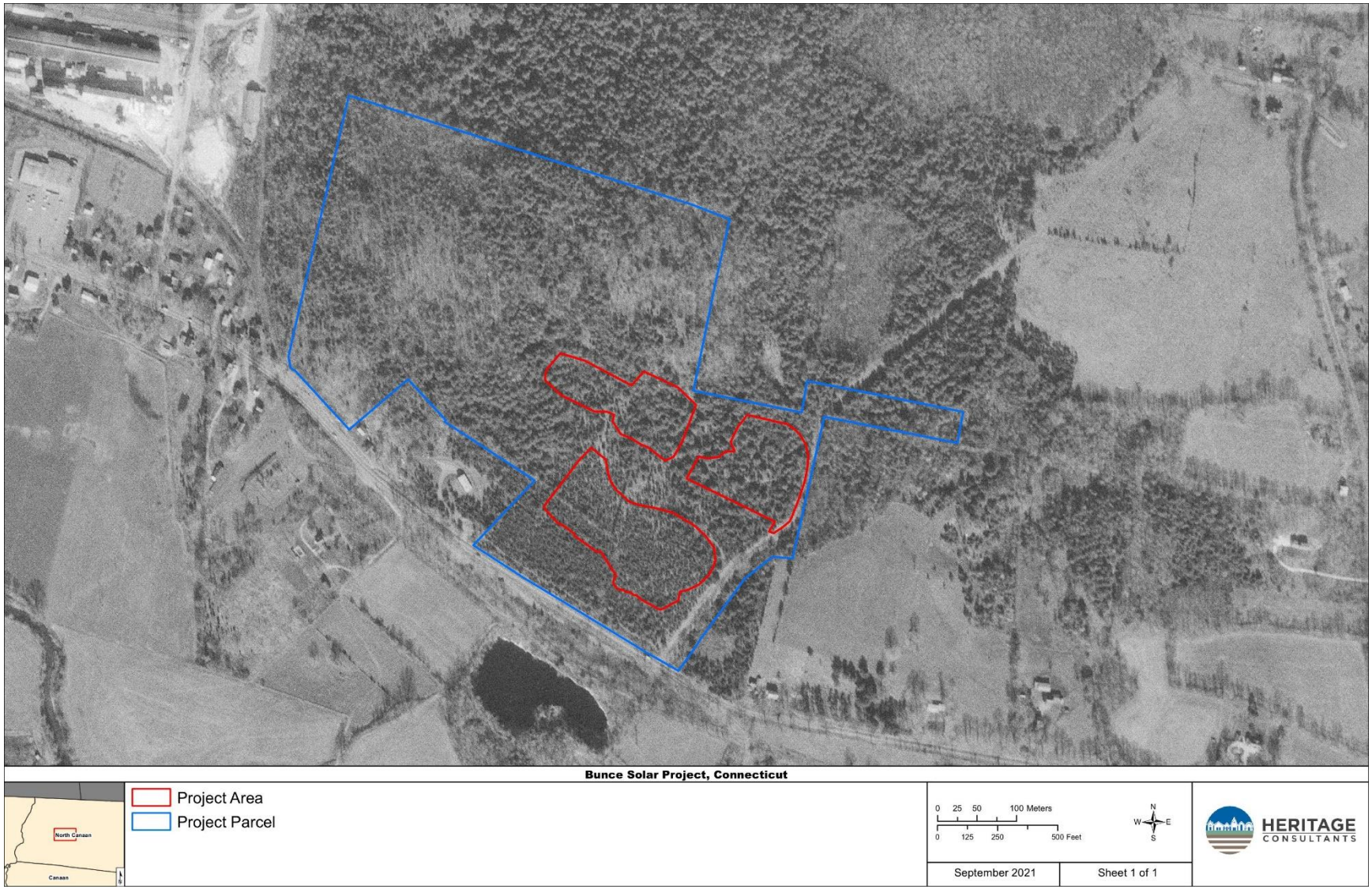

Figure 8. Excerpt from a 1969 aerial photograph showing the location of the project area in North Canaan, Connecticut.

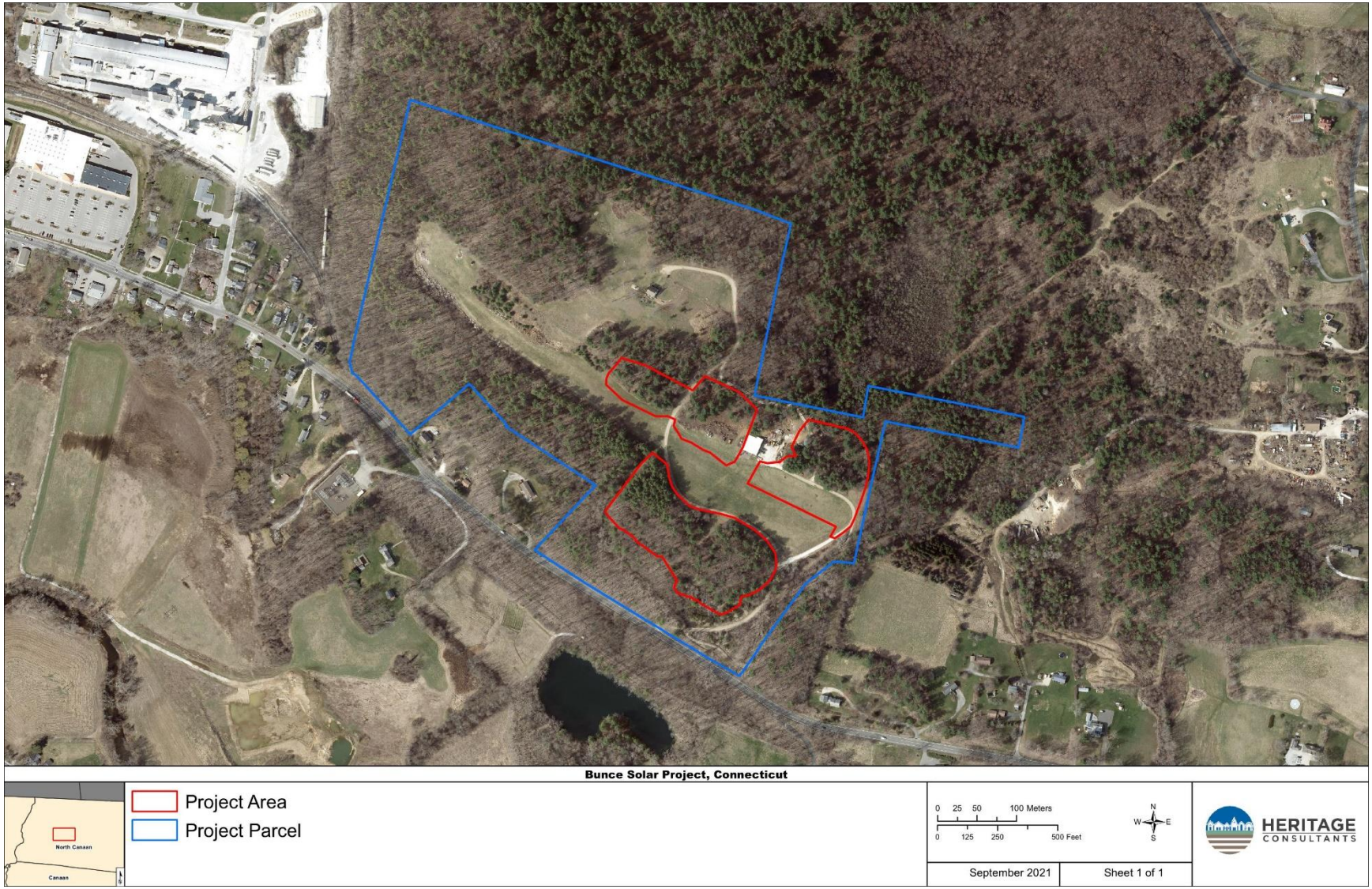

Figure 9. Excerpt from a 2019 aerial photograph showing the location of the project area in North Canaan, Connecticut.

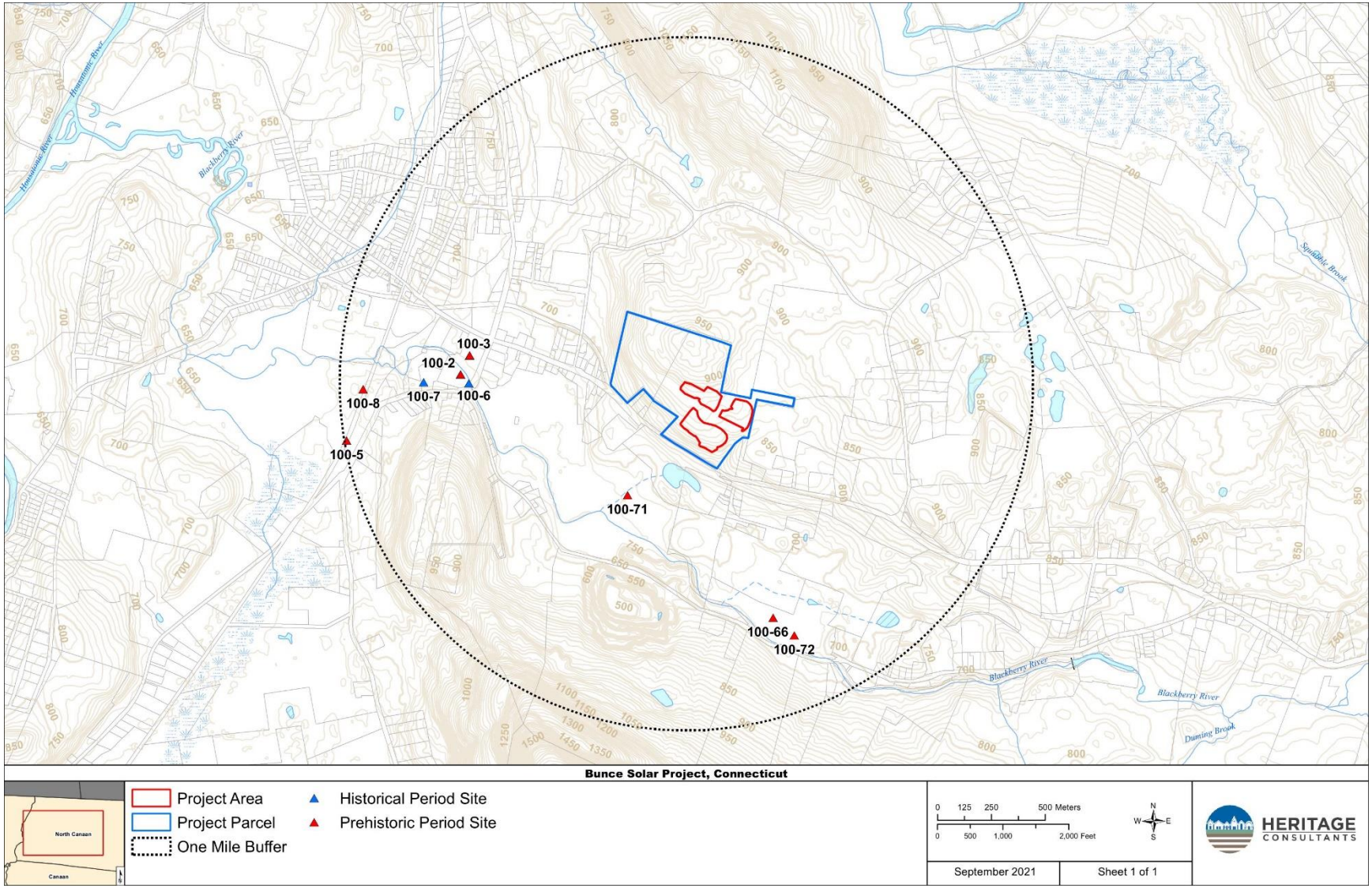

Figure 10. Digital map showing the location of previously identified archaeological sites in the vicinity of the project area in North Canaan, Connecticut.

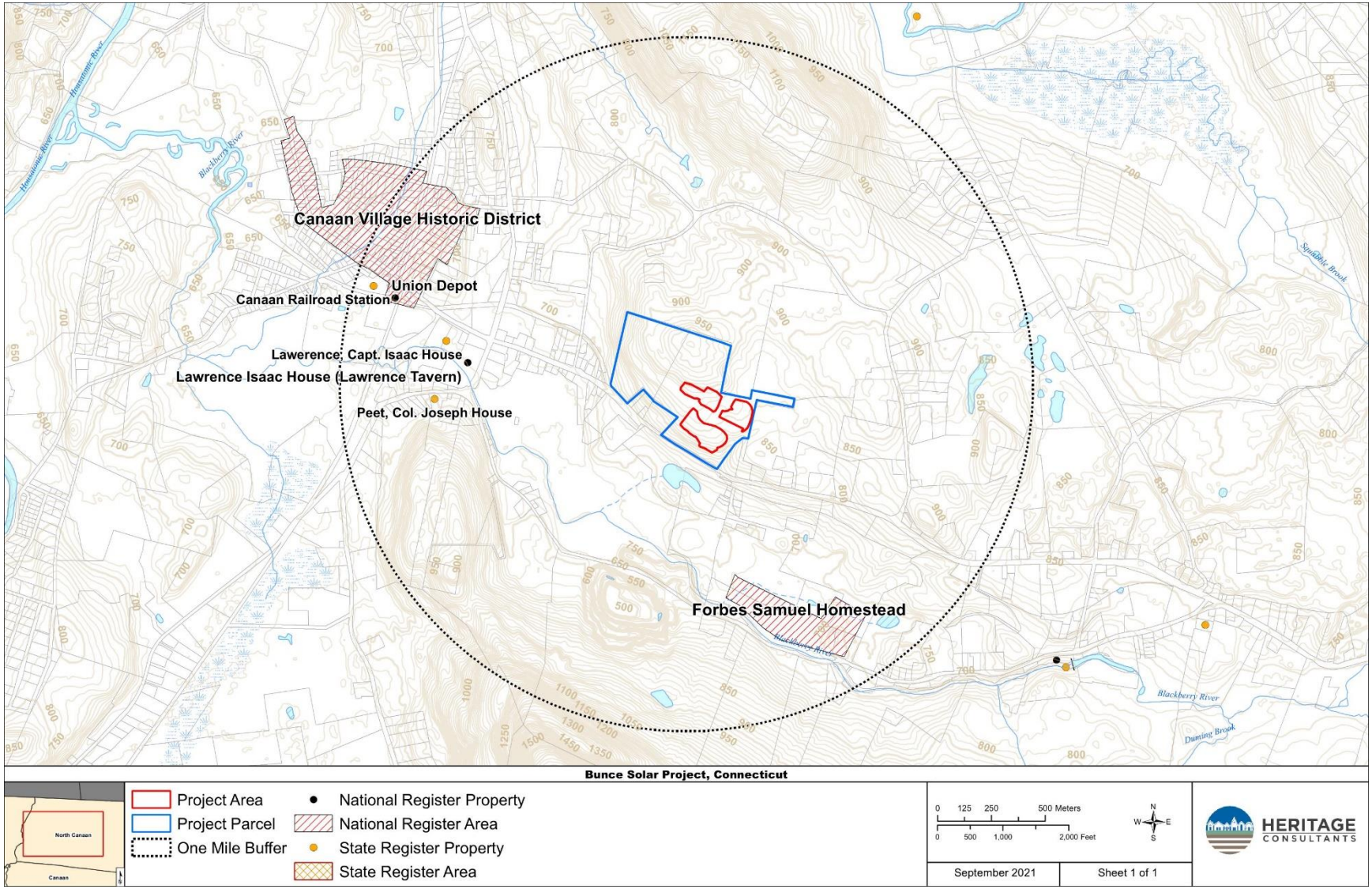

Figure 11. Digital map depicting the locations of previously identified National/State Register of Historic Places properties in the vicinity of the project area in North Canaan, Connecticut.

Photo 1. Overview photo of impact area in North Canaan, Connecticut looking east.

Photo 2. Overview photo of the impact area looking west along the project area in North Canaan, CT.

Photo 3. Overview photo of central portion of impact area in North Canaan, Connecticut. The view is north.

Photo 4. Overview photo showing eastern portion of impact area in North Canaan, Connecticut. View is northeast.

Photo 5. Overview photo showing western portion of the impact area in North Canaan, Connecticut. View is northwest.

Photo 6. Overview photo showing eastern portion of impact area in North Canaan, Connecticut. View is north.

Photo 7. Overview photo showing central portion of impact area in North Canaan, Connecticut. View is north.

Photo 8. Overview photo showing western portion of impact area in North Canaan, Connecticut. View is east.

Photo 9. Overview photo showing northern portion of impact area. View is south.

Photo 10. Overview photo of impact area in North Canaan, Connecticut. View is east.

Photo 11. Overview photo taken from central portion of impact area in North Canaan, Connecticut. View is west.

Photo 12. Overview photo taken from central portion of impact area in North Canaan, Connecticut. View is northeast.

Photo 13. Overview photo taken from eastern portion of impact area in North Canaan, Connecticut. View is west.