



ENVIRONMENTAL ASSESSMENT

PROPOSED DURHAM SOLAR FACILITY INSTALLATION

THE DURHAM MANUFACTURING COMPANY

201 MAIN STREET

DURHAM, CONNECTICUT

MIDDLESEX COUNTY

Prepared for:

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1 Project Introduction

All-Points Technology Corporation, P.C. ("APT") prepared this Environmental Assessment ("EA") on behalf of Pfister Energy, Inc. ("Pfister") and Durham Manufacturing Company ("Durham Manufacturing") for the proposed installation of an approximately 1.425 megawatt ("MW") solar-based electric generating facility ("Project" or "Facility") in the Town of Durham, Connecticut (the "Town").

This EA has been completed to support Durham Manufacturing's submission to the Connecticut Siting Council ("Council") of a petition for declaratory ruling that no Certificate of Environmental Compatibility and Public Need is required for the construction, maintenance, and operation of the Project.

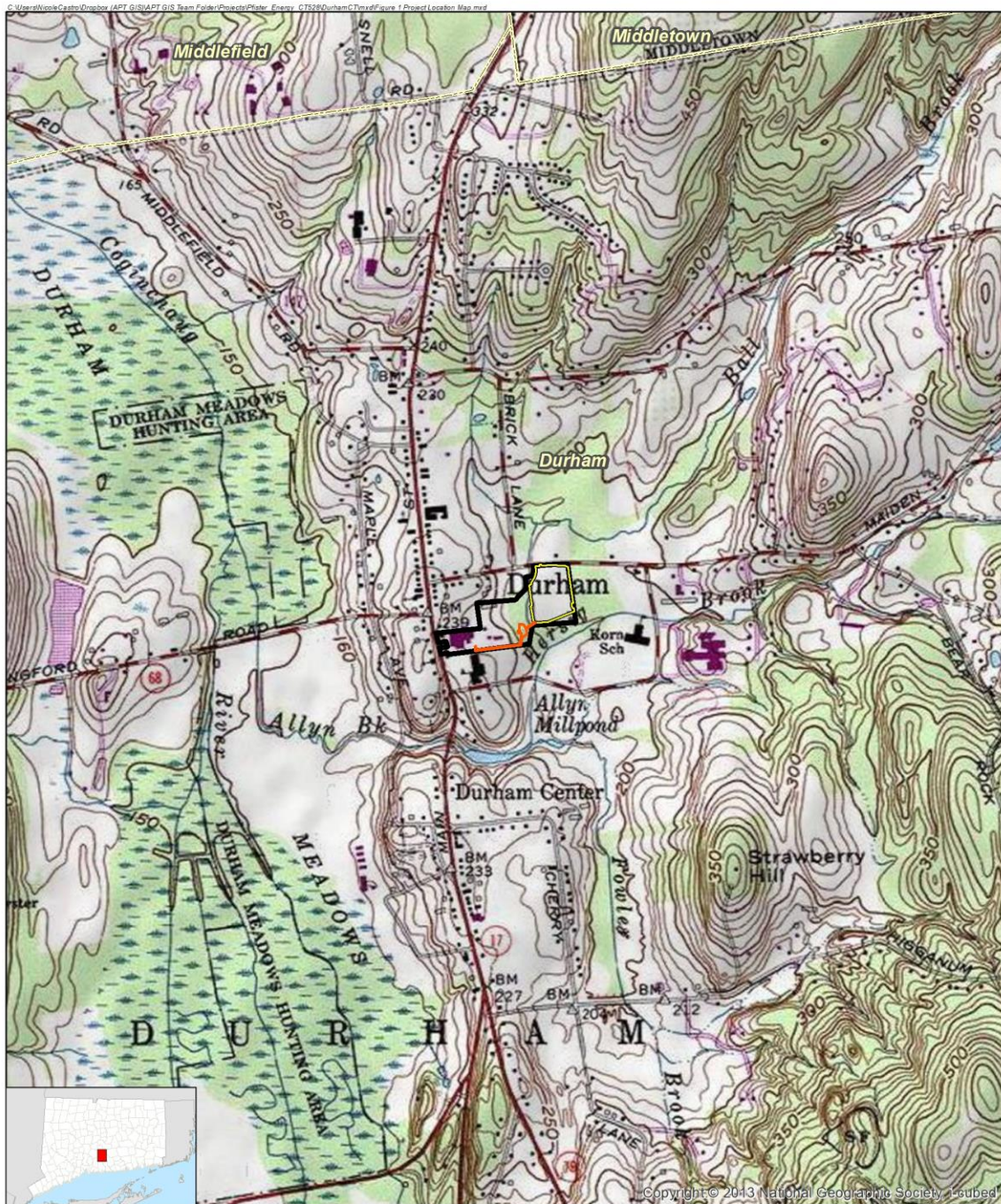
The Project will be located at 201 Main Street in Durham, Connecticut ("Site"). The Site consists of approximately 18.08 acres owned by Durham Manufacturing. The western portion of the Site is occupied by Durham Manufacturing's North American plant and offices. The eastern portion of the Site consists of a mostly open field most recently used as a Christmas tree business. The east and west sides of the Site are bisected by Ball Brook. A second watercourse, Hersig Brook, flows along the Site's southeast boundary.

The Site is situated east of Main Street and south of Maiden Lane. The immediate Site vicinity is characterized as a mix of commercial development to the west, residential and agricultural land use to the north and east (some of which is owned by Durham Manufacturing), and the Town's school complex to the south.

Upon its completion, the Facility will occupy approximately 4.72 acres of the Site. The Project has been designed to provide Durham Manufacturing with approximately 80% of its daily electrical needs. The Facility will be comprised of approximately 4194 340W Mission Solar MSE340SO6J photovoltaic modules installed at a tilt angle of 30 degrees, 24 SMA Corel 50kW inverters, one (1) SMA Tripower 15 kW Inverter, and two (2) underground service interconnection points that will tie directly into the plant. The Facility will use a ground mounted, pile-driven, racking system and be enclosed by security fencing. To enable development of the primary components of the Facility, approximately 6.40 acres require some level of disturbance ("Project Area"). Also, underground utility lines will be installed to connect

the Facility to the Durham Manufacturing plant, requiring the establishment of an approximately 893 feet long by 4 feet wide utility corridor (the "Utility Corridor"), resulting in an additional 0.41-acre area of disturbance to facilitate its construction.

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



Legend

- Approximate Site Boundary
- Project Area
- Utility Corridor
- Municipal Boundary

Map Notes

Base Map Source: USGS 7.5 Minute Topographic Quadrangle
 Maps: Durham, CT (1984)
 Map Scale: 1 inch = 1,500 feet
 Map Date: February 2018

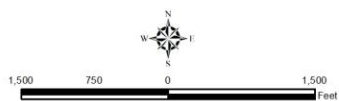


Figure 1
Project Location Map

Proposed Solar Facility
 Durham Manufacturing Co.
 201 Main Street
 Durham, Connecticut



2 Existing Conditions

The purpose of this section is to describe current conditions of the Site. A detailed discussion of the proposed Project's effects on the environment is provided in following sections of this document.

2.1 Project Location

The Site consists of a single parcel owned by Durham Manufacturing, located east of Main Street and south of Maiden Lane, encompassing a total of approximately 18.08 acres in the center of Durham. The Site is developed in its western half by Durham Manufacturing. The eastern side of the Site is undeveloped and was most recently used as a Christmas tree business.

The Project Area and Utility Corridor collectively consist of approximately 6.81 acres of fields, cultivated trees and bordering wooded land with direct access from Maiden Lane to the north, and developed portions of the Durham Manufacturing plant. Ball Brook flows generally in a north to the south direction in the central portion of the Site. Hersig Brook is located along the Site's southeast boundary.

2.2 Site Access

An existing access originating off Maiden Lane will be modified for entrance to the Facility. Primary access to the Durham Manufacturing plant is from Main Street into the western developed portion of the property.

Figure 2, *Existing Conditions Map*, depicts current conditions on the Site, its access, abutting properties, and several features discussed herein.

2.3 Wetlands and Watercourses

Eric Davison, a Connecticut registered Professional Soil Scientist, conducted an inspection on October 17, 2017 to field delineate wetland boundaries on or proximate to the Site. Mr. Davison identified three (3) wetland areas, consisting of two (2) riparian corridors associated with Ball Brook and Hersig Brook, as well as a man-made pond associated with Ball Brook located east of the paved parking areas associated with the Durham Manufacturing plant, and a smaller

isolated wetland in the southeast corner of the Site. A copy of Mr. Davison's *Wetlands/Watercourses Delineation Report* is included as Appendix A. The wetland resources are summarized below and depicted on Figure 2.

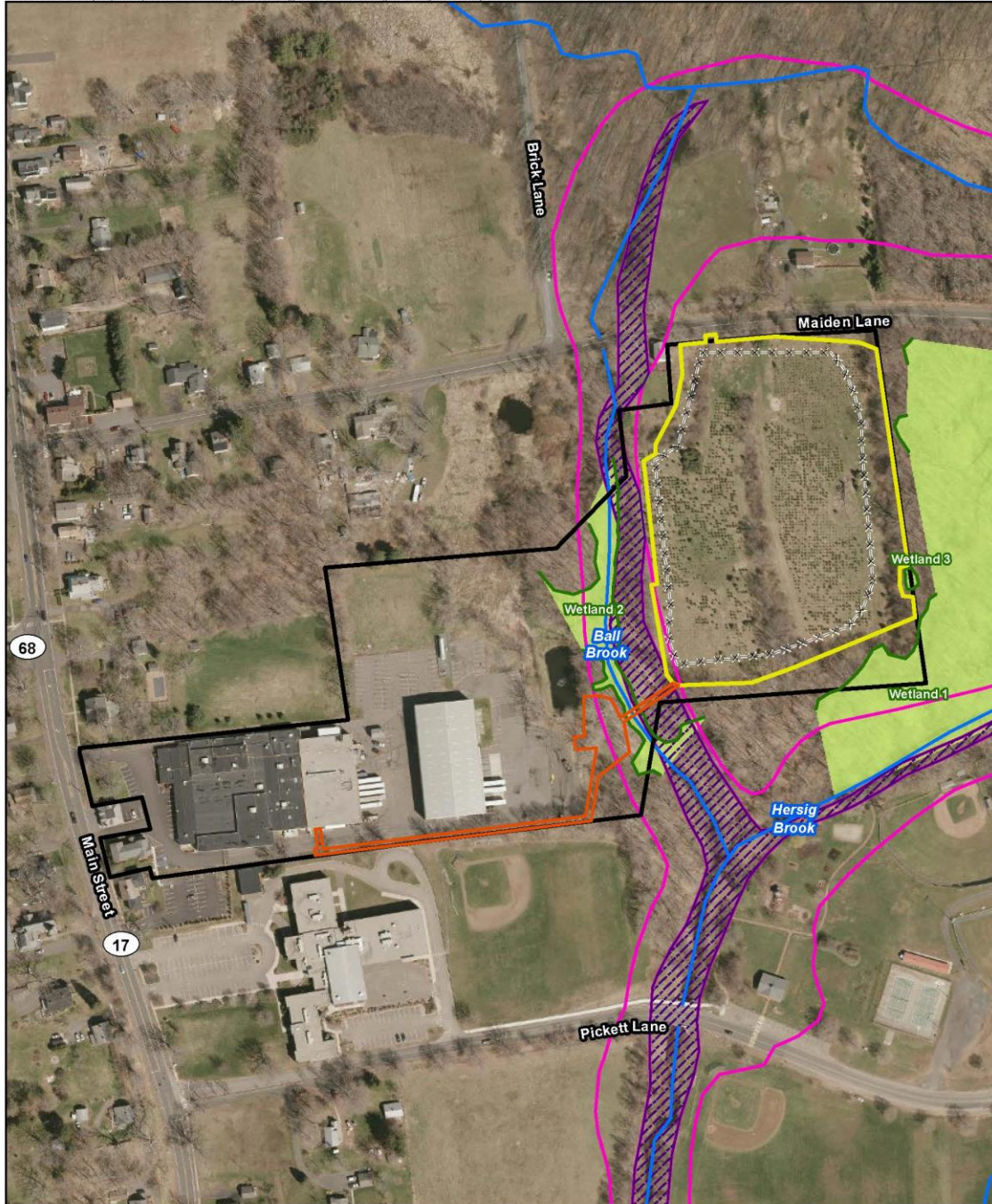
Wetland 1 consists of a broad forested riparian corridor associated with Hersig Brook. Resource areas proximate to the Site consist of depressional forested wetland systems that drain south to the off-Site Hersig Brook perennial stream. Areas within Wetland 1 contain discrete hummock/hollow topography and isolated depressions that have the potential for supporting vernal pool breeding habitat. Due to time of year restrictions, evidence of vernal pool breeding could not be confirmed during the field inspections.¹ The Project Area has been configured to avoid direct impacts to Wetland 1.

Wetland 1 eventually drains south and west converging with Ball Brook far off-Site to the south.

Wetland 2 consists of a narrow perennial stream system with little to no bordering vegetated wetlands. This system flows north to south eventually converging with Wetland 1 off-Site. The perennial stream, identified as Ball Brook, consists of an approximately 5- to 8-foot wide bank with a stone/cobble bottom. The stream is well incised and shows evidence of historic alteration and channelization. At one point, the stream was historically manipulated resulting in an open water impoundment. The wetland is entirely forested and dominated by a mix of red oak and green ash with a sparse understory. Wetland 2 does not appear to contain the potential for vernal pool breeding habitat.

Wetland 3 consists of a small, isolated wetland depression pocket located directly southeast of the Project Area. This wetland does not contain any surficial, hydrological connection to Wetland 1. The depressional nature of this wetland supports the potential for vernal pool breeding habitat. The Project Area has been configured to avoid direct impacts to Wetland 3.

¹ A Wetland and Vernal Pool Protection Plan has been developed to avoid unintentional impacts to vernal pools (see Section 3.6).



Legend

- | | |
|--------------------------------|------------------------------|
| Approximate Site Boundary | Wetland Area |
| Project Area | Watercourse (CTDEEP) |
| Ground-mounted Fenced Facility | FEMA Flood Zones (FEMA NFHL) |
| Utility Corridor | 100-Year Flood Zone |
| Delineated Wetland Boundary | Floodway |

Map Notes:
 Base Map Source: CTECO 2016 Aerial Photograph
 Map Scale: 1 inch = 250 feet
 Map Date: March 2018



Figure 2
Existing Conditions Map

Proposed Solar Facility
 Durham Manufacturing Co.
 201 Main Street
 Durham, Connecticut



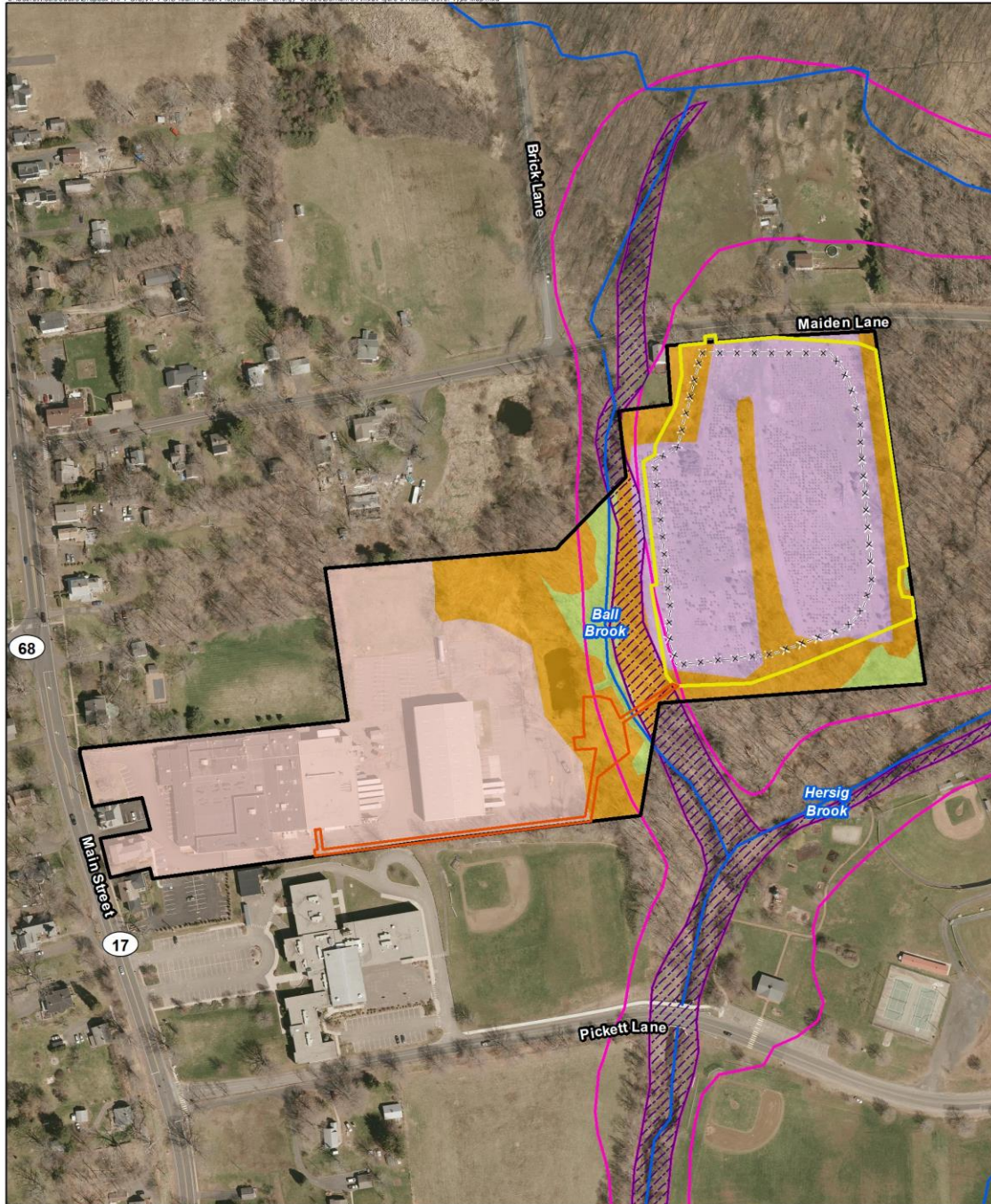
2.4 Vegetation and Wildlife

The Project Area is located almost entirely within an open field with sparse sapling tree growth associated with the Site's former Christmas tree business. Some "edge" upland forest clearing will be required on all sides of the Site to prevent shading and to provide critical space for the Project. Peripheral wetland forest habitat is also located in proximity to the Project Area and is proposed to be crossed by the Utility Corridor. As such, four (4) habitat types have been identified on the Site, including three (3) within and proximate to the Project Area. The vegetative communities located on the Site are depicted on Figure 3, *Habitat Cover Type Map* and described below.

Early Open Field/Commercial Tree Business Habitat: This habitat encompasses a majority of the Project Area, occupying approximately 5.4 acres. The early open field/tree business habitat consists of a mix of maintained open field with intermixed evergreen tree plantings that was managed as a commercial Christmas tree business for more than 20 years. The areas between the planted evergreens are dominated by regularly mowed cool-season grasses. The evergreen species are consistent of typical species planted for Christmas tree sales (such as balsam fir, blue and Norway spruce, for example). Intermixed access routes occur in between the tree planting areas, generally running from north to south.

Edge Upland Forest: This habitat comprises the eastern, western and southern peripheries of the Site. In addition, a narrow strip of edge forest occurs in the center of the Site, consisting of a windrow of individual trees dominated by mature black cherry and shagbark hickory. The edge forest to the east, west, and south are peripheries of relatively larger forested areas that are fragmented by nearby industrial, institutional and residential development. These forested areas are dominated by red maple, red oak, and black cherry. Tree widths generally range from 8 to 20 inches. The forest is characterized by a mostly even-aged forest with a closed canopy and sparse understory. This habitat type covers approximately 4.6 acres of the Site.

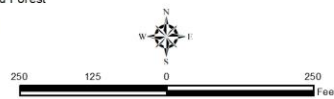
Wetland Forest: This habitat consists of areas where the Edge Upland Forest block overlaps the proximate wetland areas (introduced above as Wetlands 1, 2, and 3). These Wetland Forest areas are primarily dominated by mature red maple and green ash ranging in width from 6 to 18 inches. This forest type is mostly even aged with a closed canopy. The understory



Legend

- | | | |
|--------------------------------|-----------------------|------------------------------|
| Approximate Site Boundary | Open Field/ Tree Farm | FEMA Flood Zones (FEMA NFHL) |
| Project Area | Wetland Forest | Floodway |
| Ground-mounted Fenced Facility | Edge Upland Forest | |
| Utility Corridor | Developed | |
| Watercourse (CTDEEP) | | |

Map Notes:
 Base Map Source: CTECO 2016 Aerial Photograph
 Map Scale: 1 inch = 250 feet
 Map Date: February 2018



**Figure 3
 Habitat Cover Type Map**

Proposed Solar Facility
 Durham Manufacturing Co.
 201 Main Street
 Durham, Connecticut



consists of sparse scrub/shrub vegetation. Interior to this cover type is the small area of open (impounded) water associated with Wetland 2. The Wetland Forest type covers approximately one (1) acre of the Site.

Developed: The Site contains approximately seven (7) acres of developed land occupied by the Durham Manufacturing Company. These Developed areas consist of impervious surfaces such as paved parking/access and industrial buildings, as well as maintained lawn/landscaping.

2.5 Rare Species

The Connecticut Department of Energy and Environmental Protection ("CTDEEP") 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. Maps have been developed to serve as a pre-screening tool to help applicants determine if there is a potential impact to state listed species.

The NDDB maps represent approximate locations of endangered, threatened and special concern species and 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 CTDEEP 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) areas 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 most recent CTDEEP NDDB mapping (December 2017) to determine if any such species or habitats occur within the vicinity of the Site. Based on the NDDB mapping, the entire Site is located within a cross-hatched area, indicating that Threatened or Endangered species, species of Special Concern or critical habitats may exist. On January 5, 2018, APT submitted a review request to the CTDEEP NDDB with respect to this Project to determine if any of the abovementioned concerns exist at the Site. A response from CTDEEP NDDB was received on February 19, 2018 indicating that the State Listed Species of Special Concern slimy sculpin (*Cottus cognatus*) is associated with Hersig Brook in this area of Durham. The response indicated that a CTDEEP Fisheries Biologist will review permit applications to determine if the

Project could adversely affect the slimy sculpin. Slimy sculpin is a cold-water fish that inhabits rocky riffles of cold streams, rocky areas of lakes, springs, and their effluents. This species spawns in shallow water. A copy of the CTDEEP NDDB Determination Letter is included in Appendix B.

2.6 Groundwater Classification

Groundwater underlying the western portion of the Site is classified by the CTDEEP as “GA, GAA may not meet current standards”. The classification indicates that groundwater within the area may not meet the objective of GA/GAA groundwater, which is to be suitable for human consumption without treatment. Designated uses in GA/GAA-classified areas include existing private and potential public or private supplies of drinking water and base flow for hydraulically-connected surface water bodies. Groundwater on the eastern portion of the Site, beneath the Project Area, is classified as “GA”. The GA classification indicates groundwater within the area is presumed to be suitable for human consumption without treatment. Designated uses in GA-classified areas include existing private and potential public or private supplies of drinking water and base flow for hydraulically-connected surface water bodies.

No aquifer protection areas are located on or proximate to the Site.

2.7 Surface Water Classification

Ball Brook traverses the central portion of the Site generally in a north-south direction. Ball Brook is classified by CTDEEP as a Class A surface waterbody. Designated uses for Class A surface waterbodies include habitat for fish and other aquatic life and wildlife; potential drinking water supplies; recreation; navigation; and water supply for industry and agriculture. In addition, Hersig Brook, which extends along the southeast portion of the Site, is also classified as a Class A surface waterbody by the CTDEEP.

2.8 Drainage Basin

Based upon CTDEEP mapping, the Site is located in Major Drainage Basin 4 (Connecticut River), Regional Drainage Basin 46 (Mattabesset), and Subregional Drainage Basin 4605 (Allyn Brook). The majority of the Site is located in Local Drainage Basin 4605-04 (Ball Brook at mouth above Hersig Brook). Extreme southeastern portions of the Site are located in Local Drainage Basin 4605-01 (Hersig Brook above unnamed brook).

2.9 Scenic Areas

The portion of Main Street (aka State Route 17) fronting the Site is a State-designated scenic road.

2.10 Historic and Archaeological Resources

Heritage Consultants LLC of Newington, Connecticut, reviewed relevant historic and archaeological information to determine whether the Site holds potential cultural resource significance. The nearest historic resources are the Main Street Historic District (which is listed on the National Register of Historic Places) and four State Register of Historic Places properties. In addition, the H. Tucker House, at 63 Maiden Lane, is located adjacent to the northwest corner of the Project Area. This house, which dates from the nineteenth century, has been altered over time and no longer retains much of its historical character; thus, it is not eligible for listing on the National Register of Historic Places.

There are no reported archaeological sites² within one-half mile of the Site. The Project Area is proximal to two (2) small brooks and therefore, it was determined to retain a moderate/high archaeological sensitivity. APT submitted Project and Site historic/cultural information to the State Historic Preservation Office ("SHPO") for agency review and comment on January 24, 2018.

The SHPO's response is pending and will be provided to the Council upon receipt. A copy of the *SHPO Submission* is included in Appendix C.

2.11 Geology and Soils

Surficial materials on the Site are comprised of thin and thick deposits of glacial till and deposits of fines. Soils located on and in the area of the Site are identified as Wethersfield loam and Ludlow silt loam. Bedrock geology beneath the Site is identified as Portland Arkose (of the Lower Jurassic). Portland Arkose is described as a reddish-brown to maroon micaceous arkose and siltstone and red to black fissile silty shale. This formation grades eastward into coarse conglomerate (fanglomerate).

² Archaeological Preserves are State Register districts developed from archaeological data.

2.12 Farmland Soils

Farmland soils include land that is defined as prime, unique, or farmlands of statewide or local importance based on soil type, in accordance with the Code of Federal Regulations, CFR title 7, part 657. It identifies the location and extent of the most suitable land for producing food, feed, fiber, forage, and oilseed crops and is available for these uses.

According to the Connecticut Environmental Conditions Online Resource Guide³, the entire Site contains Prime Farmland soils, including the Project Area that had been most recently used to grow and sell Christmas trees. Routine manicuring and annual tree sale activities have subjected the area to compaction from equipment and vehicles, as access corridors are clearly evident throughout the field. No plowing or crop rotation has occurred in the Project Area for several decades.

2.13 Floodplain Areas

APT reviewed the United States Federal Emergency Management Agency ("FEMA") Flood Insurance Rate Map ("FIRM") for 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 of the Site is mapped on FIRM PANEL #09007 C0206 G, dated August 28, 2008. Based upon the reviewed FIRM Map, the majority of the Site, including the Project Area, is designated as "unshaded" Zone X, which is defined as an area of minimal flooding outside of the 100-year and 500-year flood hazard zones. Portions of the Site that are located adjacent to Ball Brook and Hersig Brook are classified as Floodway and Zone AE, which is defined as a high flood risk area.

2.14 Recreational Areas

The nearest recreational area is the Town of Durham Athletic Fields and Tennis Courts, which are located approximately 400 feet to the south of the Site. Additional recreation areas are located in the Town but not proximate to the Site.

³ Connecticut Environmental Conditions Online (CTECO) Resource Guide www.cteco.uconn.edu.

2.15 Noise

A Noise Evaluation Study was prepared for the Project by HMB Acoustics LLC of Avon, Connecticut⁴. Based on sound measurements obtained at the Site and adjacent locations, the average levels range from 38 to 42 dBA⁵.

2.16 Lighting

No permanent lighting sources exist in the Project Area today. The Durham Manufacturing plant maintains lighting for security purposes.

2.17 Other Surrounding Features

The locations of non-residential development and other resources within two miles of the Site are listed in Table 1, *Non-Residential Features within Two Miles of the Site*) and depicted on Figure 4, *Surrounding Features Map*.

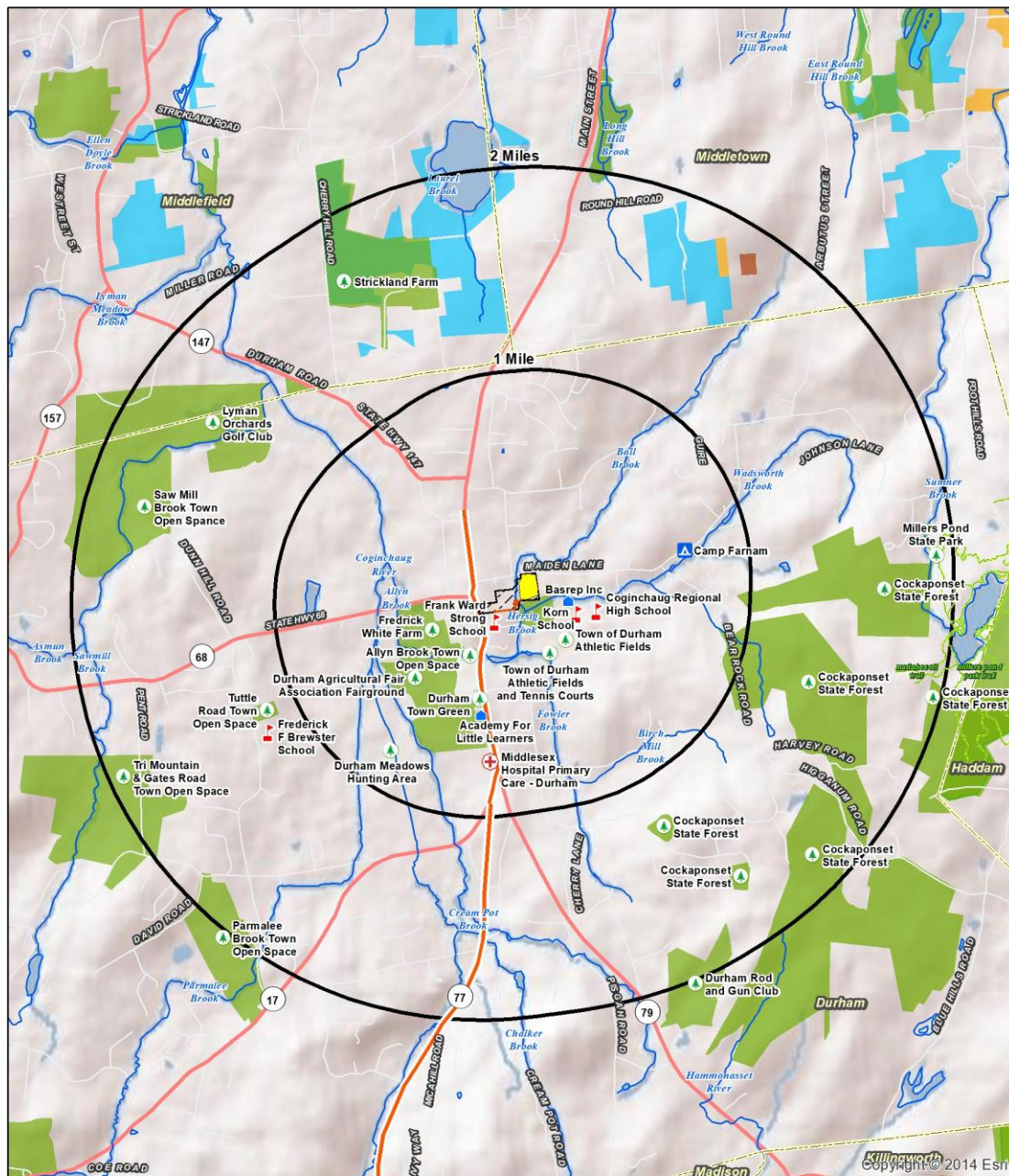
⁴ The HMB report is provided in Appendix I. See also the Noise discussion in Effects on Environment section of this document.

⁵ Sound measurements obtained on December 26, 2017 by HMB Acoustics LLC, of Avon, Connecticut.

Table 1: Non-Residential Features within Two Miles of the Site

Resource Type	Name	Address (all locations in Durham, except where noted)	Distance from Project Area
Daycare	Basrep Inc	144 Pickett Lane	0.16 SE
	Academy For Little Learners	68 Main Street	0.62 SW
Hospital	Middlesex Hospital Primary Care - Durham	6 Main Street	0.82 SW
Schools	Coginchaug Regional High School	135 Pickett Lane	0.27 SE
	Korn School	144 Pickett Lane	0.14 SE
	Frank Ward Strong School	191 Main Street	0.14 SW
	Frederick F Brewster School	126 Tuttle Road	1.39 SW
Recreation/ Park	Town of Durham Athletic Fields and Tennis Courts	Pickett Lane	0.07 S
	Town of Durham Athletic Fields	Pickett Lane	0.19 S
	Fredrick White Farm	Maple Avenue	0.43 W/SW
	Allyn Brook Town Open Space	Main Street	0.37 SW
	Durham Town Green	Main Street	0.52 SW
	Tuttle Road Town Open Space	Tuttle Road	1.37 SW
	Parmalee Brook Town Open Space	Parmalee Hill Road	2.07 SW
	Tri Mountain & Gates Road Town Open Space	Rent Road	1.96 SW
	Saw Mill Brook Town Open Space	Dunn Hill Road	1.79 NW
	Durham Meadows Hunting Area	North of Parmalee Hill Road	1.00 SW
	Durham Agr Fair Assn Fairground	24 Town House Road	0.66 SW
	Lyman Orchards Golf Club	70 Lyman Road, Middlefield, CT	1.43 NW
	Strickland Farm	Cherry Hill Road, Middlefield, CT	1.70 NW
	Millers Pond State Park	344 Foot Hills Road	2.00 E/NE
	Cockaponset State Forest	Southwest of Haddam Quarter Rd	1.00 E
	Cockaponset State Forest	East of Bear Rock Road	0.94 SE
	Cockaponset State Forest	North of Old Harvey Road	2.00 SE
	Cockaponset State Forest	Southwest of Higganum Road	1.70 SE
	Cockaponset State Forest	South of Old Blue Hills Road	1.69 SE
	Cockaponset State Forest	North of Old Blue Hills Road	1.28 SE
	Durham Rod and Gun Club	418 Madison Road	1.90 SE
Youth Camp	Camp Farnam	285 Maiden Lane	0.75 W/NW

Note: No Community Centers or Senior Facilities are located within two (2) miles of the Site.



- Legend**
- Project Area
 - Utility Corridor
 - Approximate Site Boundary
 - 1-2-Mile Radii
 - Scenic Highway
 - Municipal Boundary
 - Municipal and Private Open Space Property (CTDEEP GIS)
- Protected Open Space Property (CTDEEP GIS) Surrounding Features (within 2-miles)**
- Federal
 - Land Trust
 - Municipal
 - Private
 - State
 - Trail
 - Daycare
 - Health Care
 - Park/Recreation
 - School
 - Youth Camp

Base Map Source: ESRI & CTDECO Shaded Relief
Map Scale: 1 in = 3,500 ft Map Date: February 2018



Figure 4
Surrounding Features Map
Proposed Solar Facility
Durham Manufacturing Co.
201 Main Street
Durham, Connecticut



3 Effects on the Environment

The purpose of this section is to analyze and discuss the Project's potential effects on the environment and demonstrate that the proposed development will have no significant adverse effect on the surrounding environment.

3.1 Proposed Project Development

The Project Area (including solar panel arrays and related Facility improvements, access, construction staging and laydown areas) and the Utility Corridor will require some clearing for development. Once constructed, the fence-enclosed Facility will occupy 4.72 acres.

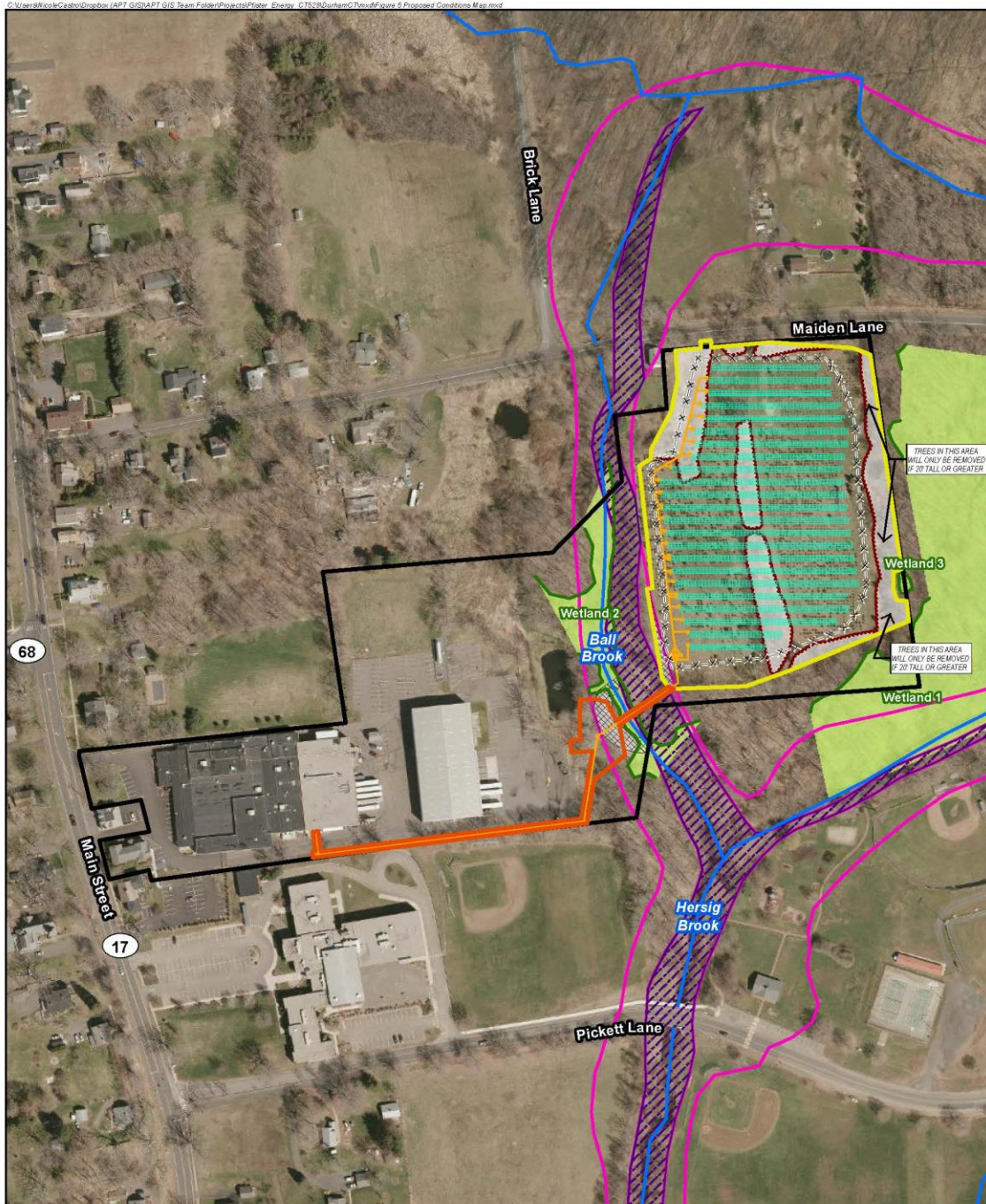
In total, approximately 1.45 acres of tree clearing is required, including the small deciduous windrow in the center of the Project Area (approximately 0.67 acre). The periphery of the Project Area is forested land with a mix of coniferous and deciduous species ranging from 6 to 28 inches in diameter. Approximately 0.78 acre of this portion of the Project Area will be selectively cut to prevent shading of the Facility. As a result of the pile-driven installation of solar panel arrays, new soil disturbances will be minimized to facilitate the installation of the solar arrays and associated equipment. The majority of the Project Area includes relatively level grades such that the solar field can be development without significant cuts and/or fills. The underground electrical interconnection to the Durham Manufacturing plant will require crossing Ball Brook to establish the Utility Corridor.

The Facility will be comprised of approximately 4,194 340W Mission Solar MSE340SO6J photovoltaic modules installed at a tilt angle of 30 degrees, 24 SMA Core1 50kW Inverters, one (1) SMA Tripower 15kW Inverter, and two (2) Service Interconnection points via solar breakers. The Facility will use a ground mounted, pile-driven, racking system.

To facilitate the installation of the Utility Corridor, 0.41 acre will be temporarily disturbed for the stream crossing, including equipment staging.

Once construction is complete, disturbed areas will be seeded to re-establish or enhance permanent cover.

Figure 5, *Proposed Conditions Map*, depicts the proposed Project layout. Project Plans are provided in Appendix D.



**Figure 5
Proposed Conditions Map**

Proposed Solar Facility
 Durham Manufacturing Co.
 201 Main Street
 Durham, Connecticut



3.2 Public Health and Safety

The Project will be designed to applicable industry, State, and local codes and standards and will not pose a safety concern or create undue hazard to the general public. The Facility will not consume any raw materials, will not produce any by-products and will be unstaffed during normal operating conditions. The Facility will be enclosed by a six (6) foot tall chain-link fence (topped with an additional foot of barbed wire strands) and its entrance will be gated, limiting access to authorized personnel only.

Overall, the Project will meet or exceed all health and safety requirements applicable to electric power generation. Each employee working on Site will:

- Receive required general and Project specific health and safety training;
- Comply with all health and safety controls as directed by local and state requirements;
- Understand and employ the health and safety plan while on the Project site;
- Know the location of local emergency care facilities, travel times, ingress and egress routes; and
- Report all unsafe conditions to the construction manager.

Construction equipment will be required to access the Site during normal working hours. Please refer to the *Construction Schedule* and *Construction Work Hours/Days Letter* provided in Appendix E and Appendix F, respectively. After construction is complete and the Facility (unstaffed) is operable, traffic at the Site will be minimal. We anticipate that the Facility will require mowing two times per year. Routine maintenance of the electrical equipment will occur once per year. Annual maintenance will typically involve two technicians for a day. Any equipment that breaks down will be repaired on an as needed basis. The solar modules are designed to absorb incoming solar radiation and minimize reflectivity, such that only a small percentage of incidental light will be reflected off the panels. This incidental light is significantly less reflective than common building materials, such as steel, or the surface of smooth water. The panels will be tilted up toward the southern sky at a fixed angle of 30 degrees, further reducing reflectivity.

The leading edge of the panels will be approximately 30 to 36 inches above the existing ground surface providing 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. At this time, Pfister Energy does not envision requiring any “snow removal” operations; rather the snow will be allowed to melt or slide off as the panels warm up.

3.3 Local, State and Federal Land Use Plans

The Project is consistent with local, State, and Federal land-use plans, including the Town of Durham Plan for Conservation and Development (“Plan”; effective date August 1, 2016), which promotes the use of renewable energy sources, most notably solar energy. The Plan states that “Durham has become a shining example of what can be done with alternative forms of energy, particularly renewable solar energy”. Further, in 2012, the Town implemented its “Solarize Durham” initiative, which was “enormously successful in placing solar panels on 119 properties throughout the town, generating in excess of one megawatt of clean energy”. This Project will support the Plan’s policies and strategies by developing a renewable energy resource while not having a substantial adverse environmental effect.

3.4 Existing and Future Development

The primary beneficiary of the Project energy is Durham Manufacturing as the Facility will provide approximately 80% of the company’s electrical needs when operative. On weekends, holidays and other times the plant is not active, electricity generated by the Facility will be routed back into the Eversource Energy grid providing enhanced capacity for the community.

3.5 Roads

The existing access originating off Maiden Lane will be modified and used during construction and for permanent access to maintain and monitor the Facility. Minimal upgrades will be required for access, including developing a stable paved apron and reestablishing vegetation in select areas along the south side of Maiden Lane.

3.6 Wetlands

All clearing and grading limits for the Facility’s primary infrastructure (solar arrays, security fencing, and associated equipment) will maintain a minimum setback of at least ±10 feet from the nearest wetland resource areas. The Project Area has been configured to avoid direct impacts to wetlands.

Indirect impacts resulting from the majority of Project-related activities consist of mature tree clearing/trimming, understory removal, security fencing installation and minor grading adjacent to Wetlands 1, 2, and 3. The Facility has been designed to minimize clearing requirements in these areas. To further this goal, tree clearing adjacent to Wetlands 1 and 2 will only consist of mature trees that would cause shading of the solar arrays; low growth vegetation and ground cover would remain. A Wetland and Vernal Pool Protection Plan is proposed to mitigate impacts to these proximate wetland resources (see Appendix G for details). In addition, a replanting plan is proposed along the eastern boundary of Wetland 2 where mature upland forest clearing is proposed. These plantings will consist of regularly spaced scrub/shrub plantings under sown with an approved conservation seed mix to promote the stabilization of soils and soft ecotone transition.

Ball Brook and its narrow bordering wetlands (Wetland 2) will be temporarily impacted by the Project during the installation of underground utilities to establish the Utility Corridor. Direct impacts to Wetland 2 will consist of excavation and placement of utilities extending west from the Project Area and tying into the Durham Manufacturing building. This trench crossing will be accomplished using coffer dams to temporarily divert flows into a proposed diversion channel located west of the existing stream channel. These direct temporary wetland impacts account for approximately 288 square feet. Spoils from the trenching will be stockpiled onsite to the west of Wetland 2 to be reused in place. The stream bottom and banks of Ball Brook along with the adjoining narrow wetlands will be restored to existing conditions upon completion of the underground utility installations.

In addition, temporary impacts to the 100-year floodplain and the Ball Brook Floodway will result from the temporary stream diversion activities, including installation of the coffer dams to temporarily divert flows, trenching for utilities, and the stockpiling of spoils from the utility trenching (totals approximately 6,707 square feet). To mitigate for temporary impacts during these activities, an Erosion and Sedimentation Control Plan has been developed to prevent release of sediments to the Ball Brook riparian corridor. These controls include robust silt fence perimeter controls, the use of coffer dams to divert flows during trenching, dewatering basins, and temporary/permanent surface stabilization. Soils removed will be stockpiled and replaced after trenching work is complete to restore the native soils. These areas will be stabilized with

an approved mulch layer and under sown with a native wetland seed mix to supplement the naturally occurring seed bank in the restored soils.

Potential short-term temporary impacts associated with the Project's construction activities will be minimized by the proposed sedimentation and erosion controls, which will be installed and maintained during construction activities in accordance with the 2002 *Connecticut Guidelines for Soil Erosion and Sediment Control*. Potential long-term secondary impacts to wetland resources possibly associated with the operation of this Facility are minimized by the fact the development will be unstaffed (generating negligible traffic) and minimizes the creation of impervious surfaces by only installing a paved driveway apron for site access and maintaining/enhancing the majority of the surface around the Facility with native grass/vegetation. Stormwater generated by the proposed development will be properly handled and treated in accordance with the 2004 Connecticut Stormwater Quality Manual. Disturbed areas within the Project Area will be underlain with a cover type of short meadow grasses consistent with current conditions. Some of the existing Christmas trees may be reused to enhance screening along the Facility perimeter and the remainder cut at grade with stumps to remain where practicable. There will be some clearing and grubbing required within the center of the Project Area (where the small windrow exists and locations where existing Christmas tree root systems may conflict with installation of solar panel posts) and selective clearing along the perimeter to reduce shading effects. The proposed post-development drainage characteristics will mimic existing conditions with one exception. An increase in the time of concentration will occur in the center of the proposed Facility footprint, as a result of tree (windrow) removal activities. In order to mitigate this effect and limit the amount of disturbance, vegetative (scrub/shrub) plantings will be installed within the flow path outside the Facility perimeter fencing in the southwest corner. These added plantings will allow the proposed conditions time of concentration to equal the existing time of concentration, resulting in a zero increase in runoff for all storm events. A Stormwater Report is provided under a separate cover. As a result of the proposed development's location proximate to wetlands, best management practices ("BMPs") are recommended to avoid unintentional impacts to these resources during construction activities. These proposed BMPs are outlined in the *Wetland and Vernal Pool Protection Plan* (Appendix G). By implementing these management techniques, the proposed Project development will not result in an adverse impact to wetland resources.

3.7 Vegetation and Wildlife

The Project will consist of approximately ± 6.81 acres of ground disturbance, the majority of which is located within Early Open Field/Commercial Tree Business habitat. A small margin of Upland Forest will also be cleared of trees to reduce shading. The solar arrays, gravel and grass surfaces associated with the construction of the Project will alter the habitat types present on the Site. Provided below is an analysis of impact to the Site habitats.

Early Open Field/Commercial Tree Business Habitat: These types of successional (i.e., non-forested) habitats have potential to support some of Connecticut's rare bird species, provided they are of sufficient size and quality. To support habitat specialists, these habitat cover types typically need to be a *minimum* patch size of 10 acres. The open field block size at the Site is approximately 5.4 acres. As such, it is below the approximate *minimum* patch size for potentially supporting habitat specialists of these cover types. In addition, due to regular mowing and maintenance of the areas in between the cultivated trees over the past two decades, this habitat type is not optimal for many of the more habitat specialist species (including rare bird species). In total, approximately 5.1 acres of the 5.4-acre block of open field habitat will be occupied by the Project.

These early-successional habitat types are also capable of supporting habitat specialists that do not require as large a patch size. These are species often associated with the brushy and infrequently maintained field edges. Such species may include song sparrow, northern mockingbird and indigo bunting, among others. Again, due to the routine maintenance activities associated with commercial tree operation, and the resulting diminished habitat quality, this area currently provides suboptimal habitat for these types of species, and will likely continue to support a nearly equivalent degree of function post-construction of the Project.

Edge Upland Forest: Impacts to forested habitat adjacent to the Project consist of limited tree clearing to reduce shading. Locations for upland tree clearing are located to the east and west of the Project Area and within its central portion (totaling approximately 1.45 acres). Where feasible, supplemental scrub/shrub plantings will be used to promote the establishment of "soft" ecotone transitional area to enhance wildlife use of the edges and mitigate for the disturbance of any soils. The existing understory will be preserved where possible to also assist in this goal. Due to the narrow width of clearing, direct impacts to the outlying forested areas

will be minimized. Through the promotion and enhancement of this scrub/shrub transitional zone, species that currently utilize this edge upland forest will still have this habitat type present post-construction.

Wetland Forest: Impacts to forested habitat resulting from development of the Facility will be isolated to a single narrow patch located along the proposed utility routing through Wetland 2. These impacts have previously been summarized and discussed in the Wetlands impact section above.

Developed: The developed habitat type will not be substantially affected by the Project. Impacts to these areas will be limited to the temporary trenching for utilities, and interconnection into the Durham Manufacturing Company building. These areas currently consist of impervious and historically disturbed areas.

3.8 Rare Species

As previously introduced, a review of the most recent CTDEEP NDDDB mapping revealed that Threatened or Endangered species, species of Special Concern or critical habitats may exist at or proximate to the Site. CTDEEP responded in its February 19, 2018 correspondence that the State Listed Species of Special Concern slimy sculpin (*Cottus cognatus*) may occur in Hersig Brook (identified as Wetland 1). No Project-related impacts are proposed to this wetland resource, which consists of broad forested bordering wetlands, or to Hersig Brook itself. The Project Area is located approximately 250 feet north of Hersig Brook.

The Project's Utility Corridor will directly impact a portion of Wetland 2 (associated with Ball Brook, which is a tributary to Hersig Brook, flowing from north to south prior to its convergence). Any downstream effects on Hersig Brook from Utility Corridor excavation activities will be minimized through the implementation of the Project's Stormwater Pollution Control Plan. The Project's proposed stormwater control system does not include the use of large stormwater storage basins, mitigating the potential for thermal pollution to either Ball Brook or Hersig Brook. Secondary thermal gain resulting from the clearing of mature forest over Ball Brook for the Utility Corridor will also be mitigated through post-construction plantings to reestablish scrub/shrub and sapling vegetation. Consultation with CTDEEP Fisheries is currently underway. Any additional measures recommended for the protection of slimy sculpin will be incorporated into the Project's BMPs during construction, as required.

3.9 Northern Long-eared Bat

One federally-listed⁶ threatened species is known to occur in the vicinity of the Site, the northern long-eared bat ("NLEB"; *Myotis septentrionalis*). Northern long-eared bats' range encompasses the entire State of Connecticut. Suitable NLEB roost habitat includes trees (live, dying, dead, or snag) with a diameter at breast height ("DBH") of three (3) inches or greater. The Project will result in the removal of a limited number of trees with greater than three (3) inches DBH. Therefore, since NLEB potentially occurs in the vicinity of the Site, the Site supports potential habitat for NLEB, and the proposed activity may potentially impact its habitat, a determination of compliance with Section 10 of the ESA is required. The *Northern long-eared bat areas of concern in Connecticut to assist with Federal Endangered Species Act Compliance map* (February 1, 2016) was reviewed to determine the locations of any known maternity roost trees or hibernaculum. This map reveals that there are currently no known NLEB maternity roost trees in Connecticut. The nearest NLEB habitat resource to the Project Area is located in North Branford ±7.35 miles to the southwest. In accordance with the USFWS Key for NLEB, the Project will not likely result in an adverse effect or incidental takes⁷ of NLEB and does not require a permit from USFWS. Therefore, no further consultation with USFWS is required for the proposed activity. A full review of the Endangered Species Act Compliance Determination is provided in Appendix H, *USFWS Compliance Statement*.

3.10 Habitat Enhancement Measures

Once the perimeter fence has been installed, a narrow strip of land between the perimeter fence and the newly-created forest edge will need to remain clear of mature trees to prevent shading of the solar arrays. This area can be managed for wildlife by restricting mowing on a rotation basis every 4 to 7 years. This will allow the area to revert to late old field and create a "soft" ecotone that can provide cover and habitat for forest-dwelling wildlife and edge nesting birds. Periodic monitoring of this area from April through June may be beneficial to assess wildlife usage and better inform management of this area for wildlife. Supplemental

⁶ Listing under the federal Endangered Species Act

⁷ "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.

scrub/shrub planting may be advantageous in some locations to assist and promote the revegetation of these areas and enhancement of wildlife habitat function.

3.11 Vernal Pool

To assess a 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; the “BDP”) is 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 pools are the lowest.

As previously mentioned, due to time of year restrictions, confirmation of vernal pool breeding was not viable. Areas within Wetlands 1 and 3 contain the necessary topographic and hydrological conditions to potentially support vernal pool breeding habitat; such potential areas are all located outside the Project Area and Utility Corridor, and are mainly located off the Site on adjoining properties. Due to the sizes and complexities of these wetland areas, it is not possible to approximate the sizes and locations of vernal pool breeding habitat for purposes of reasonably estimating Project impacts, as established in the BDP. The proposed Wetland and Vernal Pool Protection Plan has been designed to promote measures to ensure no direct impacts from the Project to potential vernal pool resources and their obligate species.

Habitats potentially impacted by the Project within proximity to Wetlands 1 and 3 can largely be considered suboptimal upland habitat for obligate vernal pool species. The terrestrial habitat areas in proximity to these wetlands that will be occupied by portions of the Project are considered “undeveloped”, as defined by the BDP. However, these habitats predominately consist of open field/cultivated trees and edge forest. The open field/commercial tree habitat area consists of relatively homogenous cool season grasses that are regularly maintained through mowing. Regularly spaced tree plantings do not provide the same structure or quality of habitat that exist within a typical early successional terrestrial habitat. In addition, small areas of “edge” forest will be cleared and replaced with a “soft” ecotone area that will be allowed to revegetate as dense scrub/shrub habitat as noted above in the Habitat Enhancement

Measures. Where clearing is to occur outside the fenced perimeter of the Project, only trees causing shading of the solar arrays will be removed (stumps will not be removed) and the understory will be preserved to the greatest extent possible. Supplemental scrub/shrub plantings will be strategically placed to promote habitat enhancement and mitigate for the disturbance of any soils. Finally, the proposed Wetland and Vernal Pool Protection Plan will mitigate for potential impacts to obligate vernal pool breeding species during construction.

3.12 Water Quality

The Facility will be unstaffed and no potable water uses or sanitary discharges are planned. No liquid fuels are associated with the operations of the Project. Once operative, the stormwater generated by the proposed development will be properly handled and treated in accordance with the 2004 *Connecticut Stormwater Quality Manual*. Therefore, upon its completion the Project will have no adverse environmental effect on wetlands, watercourses or other water resources.

To safeguard these resources from potential impacts during construction, Pfister Energy is committed to implementing protective measures in the form of a Stormwater Pollution Control Plan to be finalized and submitted pending approval by CTDEEP Stormwater Management. This Plan will include monitoring of established sedimentation and erosion controls that will be installed and maintained in accordance with the 2002 *Connecticut Guidelines for Soil Erosion and Sediment Control* and the CTDEEP *Stormwater Management at Solar Farm Construction Projects*, dated September 8, 2017. Pfister Energy will also apply for a *General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities* from CTDEEP. Therefore, with the incorporation of adequate protective measures, stormwater runoff from the Project development will not result in an adverse impact to water quality associated with nearby surface water bodies.

3.13 Air Quality

No emission sources are associated with the operations of the Facility. Therefore, no impacts to air quality are anticipated as part of the proposed Project.

3.14 Scenic Areas

No state designated scenic areas will be physically or visually impacted by development of the solar Project.

3.15 Historic and Archaeological Resources

APT consulted with the SHPO for concurrence that no historic or archaeological resources will be affected by the Project. No direct views of the Facility will be achieved from locations within the Main Street Historic District or from the four (4) properties listed on the State Register of Historic Places. There will be some partially obstructed views of the Facility through intervening vegetation/landscaping from select locations on the adjacent H. Tucker House property at 63 Maiden Lane. However, as previously discussed, this house is not eligible for listing on the National Register of Historic Places. Therefore, it is APT's opinion that the Project will not have an effect on historic properties.

APT submitted Project and Site historic/cultural information to SHPO for agency review and concurrence on January 25, 2018. The SHPO response will be forwarded to the Council upon receipt.

3.16 Geology and Soils

Once vegetative clearing activities are completed, minimal grading is required for construction of the Project. 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* and the CTDEEP *Stormwater Management at Solar Farm Construction Projects*, dated September 8, 2017.

3.17 Farmland Soils

As previously introduced, the Project Area contains Prime Farmland soils and has been managed as a commercial tree business for the sale of Christmas trees over the past ±20 years. Routine manicuring and annual tree sale activities have subjected the area to compaction from equipment and vehicles, as access corridors are clearly evident throughout the field. No plowing or crop rotation has occurred in the Project Area for several decades.

Recognizing that development of the Project has a useful life and could be considered temporary in nature, Pfister Energy has proposed using a minimally intrusive method for construction of the Facility. The combination of relatively level ground and using pile-driven mounts for installation of the solar panels mitigates the need for substantive grading of the Project Area.

3.18 Floodplain Areas

The majority of the Project Area is located in an area designated as Zone X, which is defined as an area of minimal flooding.

Establishing the Utility Corridor (interconnection of the Facility to Durham Manufacturing) will require crossing Ball Brook and its flood zone, which is classified as Zone AE (the 100-year floodplain) and the brook's Floodway. Project activities within these flood hazard zones will result in temporary impacts only and will not permanently alter the hydrology or flood storage capacity of Ball Brook or its bordering wetlands.

3.19 Recreational Areas

No recreational areas will be impacted by the Project. The Town of Durham Athletic Fields and Tennis Courts are located on the abutting property to the south of the Site. The intervening area is buffered by mature growth trees and understory that will minimize potential views or sightlines of the Facility.

3.20 Noise

The only equipment proposed for the Project that will generate noise consists of the fans associated with the inverters. The Noise Evaluation Study prepared by HMB Acoustics LLC of Avon, Connecticut, determined that once the Project is constructed and in service, the combined noise levels will comply with CTDEEP criteria for Commercial Emitters to both Commercial and Residential Receiver Zones.

After the Project is constructed and in service, the highest noise level at an adjacent property is anticipated to be 45dBA, which is well below the most conservative criteria of 55 dBA for

daytime⁸ as established by the State of Connecticut Noise Control regulations (*CGS 22a/22a – 69-1 through 7*). The inverters are inactive at night. During those times the inverters are operative, noise levels at nearby property lines and/or residences will not change from existing conditions.

Please refer to the *Noise Evaluation Report* provided in Appendix I.

3.21 Lighting

No lighting is planned for the Facility.

3.22 Other Surrounding Features

No adverse effects are anticipated to the features identified in Figure 4, primarily because of their sufficient distances from the Project.

3.23 Visibility

The Facility will consist of a total of 11,200 non-reflective solar panels, as depicted in the photo-simulation provided as Figure 6. The solar panels and appurtenances will not exceed a height of approximately eight (± 8) feet above ground. The proposed electrical interconnections will be constructed underground and therefore negates the need to introduce new overhead support infrastructure. Views of the Facility may be possible from locations immediately to the north along Maiden Lane and to some degree from portions of the abutting property to the northwest, all through existing and proposed vegetative screening. Otherwise, the Project will be set back sufficiently from abutting properties and other roads and is benefited by substantial intervening vegetation, so that the Facility components will not be visible from most locations off the Site.

⁸ State of Connecticut Noise Control regulations establish a nighttime criterion of 45 dBA.



4 Conclusion

As demonstrated in this EA, the Project will comply with CTDEEP 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. The majority of the Project Area does not require excessive disturbance to accommodate the proposed development. Once operative, the Facility will be unstaffed and generate minimal traffic. The Project design minimizes the creation of impervious surfaces, and stormwater generated by the proposed development will be handled and treated in a manner consistent with the 2004 *Connecticut Stormwater Manual* and the CTDEEP *Stormwater Management at Solar Farm Construction Projects*, dated September 8, 2017.