EVERSOURCE ENERGY

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October 13, 2016

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

Re: 1620 and 1975 Lines Structure Replacement Project

Dear Chairman Stein:

Attached are an original and fifteen (15) copies of a petition on behalf of The Connecticut Light and Power Company doing business as Eversource Energy ("Eversource") requesting a Declaratory Ruling that no Certificate of Environmental Compatibility and Public Need is required for the proposed modifications to transmission lines 1620 and 1975 in Haddam, Connecticut ("Petition").

Prior to submitting this Petition, representatives from Eversource briefed municipal officials in Haddam about the Project and Eversource provided written notice of the proposed work to all abutters and the filing of this Petition with the Council. Maps and line lists identifying the abutting property owners who were notified of the Project are provided in Attachment A: 1620/1975 Lines Structure Replacement Project maps.

A check in the amount of $625 for the required filing fee is also attached.

Sincerely,

Kathleen M. Shanley
Manager – Transmission Siting

Enclosure

cc: Lizz Milardo, First Selectman Town of Haddam

THE CONNECTICUT LIGHT AND POWER COMPANY

doing business as

EVERSOURCE ENERGY

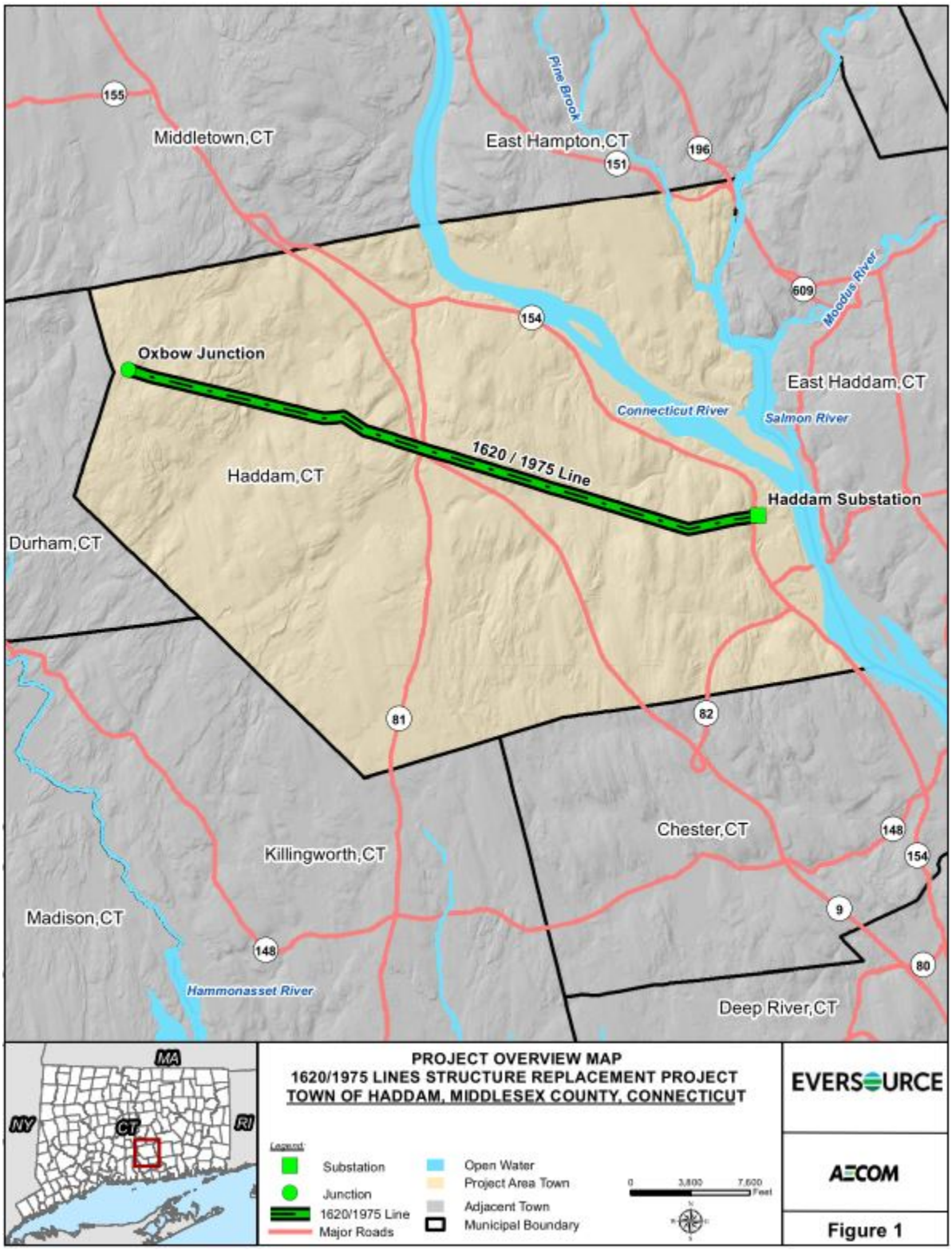
PETITION TO THE CONNECTICUT SITING COUNCIL
FOR A DECLARATORY RULING OF
NO SUBSTANTIAL ADVERSE ENVIRONMENTAL EFFECT
FOR THE PROPOSED MODIFICATIONS TO EXISTING
1620 AND 1975 LINES IN THE TOWN OF HADDAM, CONNECTICUT

1. The Connecticut Light and Power Company doing business as Eversource Energy ("Eversource" or the "Company") hereby petitions the Connecticut Siting Council ("Council") for a Declaratory Ruling that no Certificate of Environmental Compatibility and Public Need ("Certificate") is required pursuant to Section 16-50g et seq. of the Connecticut General Statutes for the modifications to structures and 1620 and 1975 transmission lines ("1620/1975 Lines") within an existing right-of-way ("ROW") in Haddam (the "Project") that are described herein. Eversource submits that no such Certificate is required because the proposed modifications would not have a substantial adverse environmental effect.

2. Purpose of the Project

The purpose of the Project is to upgrade an approximately 8 mile portion of the 1620/1975 Lines that are located entirely within Eversource's existing ROW between Oxbow Junction and Haddam Substation in Haddam. The 1620/1975 Lines are currently supported by double-circuit laminate or wood structures which are displaying significant pole and arm decay/rot due to retaining water and are in critical need of replacement. These lines have also experienced arm failures recently during fair weather, which were replaced under an emergency maintenance project. Additional wood arms and structures were identified to retain water and display severe signs of rot, even in dry conditions. The degradation of the structures jeopardizes the physical integrity and continued reliability of the 1620/1975 Lines under high wind and ice loading conditions. The existing 115-kV structures were originally constructed in the 1970s. Figure 1 illustrates the general location of the proposed Project.

Figure 1: Project Overview Map



3. Project Description

This Project scope is to replace all wood structures from Oxbow Junction to Haddam Substation within the existing Eversource ROW in Haddam. The Project will require 64 structures to be replaced within approximately 8 miles of the ROW. The existing 115-kV double-circuit laminate wood structures would be replaced with double-circuit weathering steel direct-embed monopole structures and the single-circuit guyed wood structures would be replaced with single-circuit guyed weathering steel monopole or H-frame structures. The existing conductor and shield wires would not be replaced.

The proposed modifications are shown in Attachment A and the cross sections of the ROW are provided in Attachment B.

Detail of the proposed scope of work is provided as follows:

The upgrade of the 1620/1975 Lines requires the removal of approximately 64 existing structures. The existing structures to be removed would include 56 115-kV double-circuit laminated wood monopole structures, six 115-kV single-circuit guyed wood structures and two 115-kV single-circuit wood H-frames.

a) These 64 structures would be replaced with 56 115-kV double-circuit weathering steel direct-embed monopole structures and eight 115-kV single-circuit guyed weathering steel H-frame structures.

   The proposed weathering steel monopoles would be installed in line (approximately 10 feet in front of or behind) with the existing structure locations.

   Direct-embedded structures with storm guys would be utilized for all structures that would be located within the flood zone areas with good soil conditions; self-supported structures on drilled shaft foundations would be utilized for structures located in the flood zone with poor soil conditions and for all angle structure locations.

   The height of the existing structures ranges between 68 to 101 feet above ground level. The new proposed structures would be approximately 2 to 16 feet taller than the existing double-circuit steel monopole structures with the tallest proposed structure being 107.5 in height. The difference in heights is due to varying ground elevations, and to comply

with the most recent (2012) National Electric Safety Code ("NESC") clearance requirements.

b) The existing 1272-kcmil 45/7 ACSR conductors will not be replaced and will be relocated onto the new structures.

During the Project construction, the existing transmission line structures that are not proposed to be replaced as part of the scope of this Project, (specifically lattice tower structures 4394, 4397, 4429, and 4430) will be evaluated to ensure that their structural integrity complies with Eversource's storm hardening requirements. If the structures do not comply with those requirements at the time of this additional inspection, any non-compliant structure components, such as damaged/overstressed structure members (e.g., angle braces, davit arms, cross braces) would be replaced and any damage to foundations would be repaired during the Project.

4. Project Status

The Project was initiated as an emergency maintenance project. There was a laminate arm failure and consequent unplanned line outage earlier this year that triggered an investigation of all structures on the line from Oxbow Junction to the Haddam Substation. The subsequent investigation identified 26 structures as needing immediate wood laminate arm replacement (with steel arms). Access roads were improved and pads were installed in anticipation of replacing only laminate arms on 26 identified structures. While arm replacement work commenced, a second laminate arm failure occurred on a structure that had not been identified as needing arm replacement. As a result of these occurrences, Eversource concluded that there was an unacceptable risk associated with potential rot that could not be detected with convention observation/inspection techniques and decided to replace all 64 structures. The emergency arm replacement has not been completed and work continues in parallel with this Petition to replace arms on the existing structures. The 26 structures that are currently having their arms replaced with steel will eventually be replaced as part of this Project.

5. Existing Environment, Environmental Effects and Mitigation

The proposed transmission line work described above would not have a substantial adverse environmental effect, for reasons explained more fully below.

The line upgrades would be constructed within Eversource's existing transmission ROW. All work within environmentally sensitive areas, such as water resources or habitat areas identified through the National Diversity Data Base ("NDDB") for state-listed species, would be conducted in accordance with required environmental permits and through the implementation of the Company's December *2011 Best Management Practices Manual: Connecticut* ("BMPs"), and would employ measures to avoid, minimize and/or mitigate potential adverse environmental effects.

Existing Right-of-Way

The 1620/1975 Line shares a transmission ROW with the existing 348 345-kV transmission line. The transmission lines within the ROWs were originally constructed in the 1970's. The existing structure types in the ROW include laminate wooden monopoles, wood poles (including H-frame structures) and four steel lattice structures (structures 4394, 4397, 4429 and 4430). The existing steel lattice structures will remain and will not be replaced (See Attachment B, Cross Sections). The width of the existing ROW averages 200 feet, although some portions are approximately 300 feet with approximately 200 feet of maintained ROW.

Land Use

Adjacent land use in the Project area is primarily residential and undeveloped lands including public open space and forest lands. The State of Connecticut owns and maintains select undeveloped lands in the Project area including portions of the Cockaponset State Forest that contain recreational lands with hiking trails. There is also a small area owned by Haddam Land Trust Inc. within and adjacent to a portion of the ROW.

Residential features that extend into the ROW include an open field that is used for livestock pasture and some lawn grass areas. Eversource would work with the property owners to restore these areas and other similarly improved areas impacted by the Project upon completion of the work. The ROW crosses a portion of State Highway Route 9 and Route 154.

Clearing and Vegetation Removal

No clearing would be required for the Project and all work would take place within the existing ROW and off-ROW access roads.

Some vegetation removal within Eversource's existing maintained ROW would be required to accommodate further access road installation or improvements and for installation of work pads for construction of the rebuilt line.

During vegetation removal, construction mats would be used to provide a stable base for equipment across watercourses or within wetlands and may be utilized in flood plain areas unless dry conditions allow for conventional access for construction. Such temporary support would minimize rutting in wetlands, and mats would be removed after the activities are complete.

Scenic, Recreational and Cultural Resources

Located within and adjacent to the Project area are several open space parcels and Connecticut state-designated greenways that serve as recreational and/or scenic resources. Cockaponset State Forest contains several trails that provide recreational opportunities within and adjacent to the Project. The trails located within the ROW include portions of the Mattabesett Trail (New England National Scenic Trail), Quinimay Trail, Cockaponset Forest Trails and Enduro Trail.

The Mattabesett Trail (Eagle's Beak Section) is a component of the 215-mile long New England National Scenic Trail, which was officially designated in 2009, and traverses the existing ROW within Cockaponset State Forest east of Oxbow Road and west of Candlewood Hill Road near structure 4451. The New England National Scenic Trail is a hiking trail comprised primarily of the Mattabesett, Metacomet, and Monadnock Trail systems and extends from the Connecticut shoreline to the border between Massachusetts and New Hampshire. The Quinimay Trail also crosses the existing ROW near structure 4416 within Cockaponset State Forest west of Beaver Meadow Road and east of Old Ponset Road. The Quinimay Trail extends from Westbrook to Higganum through the Cockaponset State Forest and was officially recognized by the State of Connecticut in 2008. The trail is a multi-purpose, passive-use trail for hikers, dog walkers, horseback riders and mountain bike enthusiasts.

The existing ROW is located within three state-designated greenways including the Blue Blazed Trail System Greenway, Connecticut River Gateway Zone Greenway and the Menunketesuck-Cockaponset Regional Greenway. The Blue Blazed Trail System Greenway was designated in 2001 and is a system of trails throughout the entire state comprising over 700 miles of hiking trails, including the Mattabesett Trail/New England National Scenic Trail previously described.

The Project will include replacement of two existing structures (structures 4395 and 4396) that are located within the Connecticut River Gateway Zone Greenway. This greenway was designated in 2007 and comprises the Connecticut River Gateway Conservation Zone, which has been managed since 1973 by the Connecticut River Gateway Commission for protection of natural, recreational and scenic areas within the lower Connecticut River valley. The greenway extends from the river up to the first ridgeline along both sides of the river from Haddam and East Haddam south to the mouth of the river at Old Lyme and Old Saybrook.

The Menunketesuck-Cockaponset Regional ("MCR") Greenway was designated in 2012 and is an 18-mile long greenway throughout the municipalities of Westbrook, Clinton, Deep River, Killingworth, Chester, and Haddam that functions as a wildlife and multi-use corridor connecting the Stewart B. McKinney National Wildlife Refuge - Salt Meadow Unit in the Town of Westbrook to Cockaponset State Forest, the Quinimay Trail, surrounding private forest land, and area public recreational resources that create the character of the lower Connecticut River and Coastal Region. The purpose of the Regional Greenway is to protect private/working forested land, water quality and quantity, wildlife habitat, and to provide public recreational and scenic resources. The MCR Greenway encompasses large portions of multiple towns, including the town of Killingworth and portions of the town of Haddam not located within the Connecticut River Gateway Zone Greenway. The existing 1620/1975 Lines and ROW from Oxbow Junction east to the MCR Greenway boundary pre-dates the designation of these greenways.

State Highway 154 (Saybrook Road) was designated as a Connecticut State Scenic Road in 1994 and crosses the eastern end of the ROW. Eversource does not propose to access its ROW where it crosses State Highway 154. Eversource will access structures 4395 and 4396 utilizing existing off-ROW access from Smith Hill Road. If

access to structure 4394 is required, Eversource will access this existing structure from within its existing Haddam Substation property and on-site access roads.

The Company would utilize appropriate best management practices found in the Eversource BMPs to minimize impacts in recreation and scenic areas associated with any tree trimming, vegetation removal, and potential soil erosion and sedimentation. The existing transmission line infrastructure development pre-dates the designation of these scenic resources such that these facilities were already in place and a component of the landscape at the time of designation. Minor increases in structure height are proposed for new structures compared to existing structures to be replaced; however, no adverse impacts to scenic resources are anticipated as all work will occur within existing maintained ROW containing multiple transmission lines, pole and lattice structures, access roads, etc., and the replacement structures will not materially change in height, position or appearance.

A cultural (archaeological and historical resources) resources review of the proposed line upgrade areas was conducted by Heritage Consultants, LLC ("Heritage") in July 2016. This preliminary Phase 1A cultural resources reconnaissance survey was completed using a two-step approach: (1) literature search and records review that focused on the proposed Project area; and (2) identification of all previously recorded archeological sites situated within the vicinity of the Project area.

No known historical resources are present within 500 feet of the Project area. There is one historic district (Haddam Center Historic District) within one mile of the Project located approximately 4,000 feet to the north of the eastern portion of the Project ROW. As the identified district and its properties are outside the Project area, no direct impacts to these areas would occur. Furthermore, indirect impacts associated with changes to the visual effects of the ROW from the structure replacements to any of these resources are not anticipated.

As a result of its initial review, Heritage identified three archaeological sites within the vicinity of the Project area (Sites 61-26, 61-137 and 61-138), and areas of moderate/high archaeological sensitivity for the potential presence of cultural material within sections of the Project. Eversource representatives are currently coordinating with the Connecticut State Historic Preservation Office ("SHPO") and the Tribal Historic Preservation Office(s)

regarding the potential for archaeologically, historically or culturally significant resources in the work areas. Eversource has initiated additional Phase 1B cultural resource surveys in the areas of moderate/high sensitivity and would comply with any additional mitigation measures, if required, as determined by the SHPO.

Wetlands, Watercourses, Surface Waters, Flood Zones and Floodways

Eversource contracted with the firm AECOM to identify and delineate water resources in the vicinity of the Project in 2016 (See Attachment C: Wetlands and Watercourses Report). Water resources within the Project area include inland wetlands, watercourses (intermittent and perennial streams), waterbodies (ponds), and six potential vernal pools. Water resources present in the vicinity of the Project, including Federal Emergency Management Agency ("FEMA") Flood Zones, are depicted in Attachment A. Limited work is proposed within or adjacent to water resources. Prior to initiating work, Eversource would obtain permit approvals for work in these regulated wetland resource areas.

Wetlands

Wetlands and water resources in the Project area were identified and delineated in accordance with industry standard methodology. Field surveys were completed in January, May and August 2016. Wetland and watercourse boundary locations were GPS recorded. No difference was observed between state and federal wetlands in the Project area (i.e., no moderately-well to well-drained alluvial soils subject to State jurisdiction only were observed to be present). A total of 57 wetlands were identified in or proximate to the Project area.

There are no proposed permanent wetland impacts. Temporary wetland impacts of approximately 0.83 acre (36,180 square feet) would be limited to the installation of construction mats within the existing maintained ROW to gain access to the existing and proposed structure locations and to provide a stable work surface for structure replacement, as shown in Attachment A. The construction mats would be promptly removed upon completion of the work and wetland conditions would be restored to approximately the existing conditions in accordance with Eversource's BMPs. Eversource would obtain U.S. Army Corps of Engineers Self ("USACE") Verification

approval under General Permit No. 6 for the temporary placement of construction mats in the regulated wetland prior to construction.

All work within environmentally sensitive areas, such as wetlands, watercourses or CT DEEP NDDB-identified habitat for state-listed species (see additional information in endangered species section below) would be conducted in accordance with applicable regulatory permit/authorization terms and conditions and through the implementation of Eversource's BMPs which would contribute to avoiding, minimizing, and mitigating adverse environmental effects. Attachment A includes language and detailed pertaining to implementation of selected Eversource BMPs applicable to the Project.

Watercourses and Waterbodies

There will be no permanent effects to watercourses or waterbodies associated with the proposed Project. Six named watercourses (Bible Rock Brook, Candlewood Hill Brook, Ponset Brook, Mill Creek and Turkey Hill Brook) and 21 unnamed watercourses were identified in or proximate to the Project area.

To access structure locations, Eversource would need to cross unnamed tributaries to Candlewood Hill Brook (S3 [twice] and S8), unnamed intermittent tributaries to Ponset Brook (S12 and S13), and unnamed intermittent tributaries to Pole Bridge Brook (S14 and S15) using stream-crossing techniques as detailed in Eversource's BMPs. An unnamed intermittent tributary to Mill Creek is located in close proximity (approximately 20 feet) to existing and proposed structure(s) 4415. Construction mats will be utilized for the work pad at this location and placed in a manner that minimizes disruption to the existing flow pattern. All other watercourse crossings will occur on existing access roads with existing bridged or culverted stream crossings.

Work in aquatic resource areas would be conducted in accordance with the applicable Eversource BMPs and in accordance with regulatory permit/authorization terms and conditions. Eversource would obtain requisite regulatory approvals from the USACE and CT DEEP prior to executing Project work in these regulated resource areas.

The Project would not affect any surface water resources (i.e., lakes, ponds, and reservoirs) located in the vicinity of the Project area, including Scovill Reservoir located off-ROW in the vicinity of Structures 4437 and 4439, unnamed private farm ponds between structures 4394 and 4394 (Watercourse S27), adjacent to structure 4441 (Watercourse S7), and an off-ROW unnamed pond adjacent to structure 4442 (undelineated).

Vernal Pools

Potential vernal pools, proximate to the Project area, were identified during wetland and watercourse field delineation surveys conducted in January, May and August of 2016. Visual surveys were used to identify vernal pool characteristics and indicator species[1] including larvae and egg masses. During field surveys conducted in January and August, AECOM wetland/soil scientists used their professional expertise and extensive past experience in conducting vernal pool surveys to identify potential vernal pools (see Attachment D: Vernal Pool Survey Memo). Eversource has identified six potential vernal pools in the Project area. Potential vernal pools are located in proximity to the following proposed structure work pad locations: 4399, 4400, 4401, 4411, 4412, 4425, 4426, 4427 and 4452 as depicted in Attachment A. These potential vernal pools range from immediately adjacent to the access roads to approximately 100 to 200 feet from the structure work pads noted above.

The proposed construction activities would not result in any temporary or permanent impacts to the potential vernal pool locations. Tree clearing would not occur in the vicinity of any vernal pool. BMPs would be employed to avoid or minimize impacts to vernal pools and include, for example, exclusionary fencing, syncopated silt fencing, mat bridging and other measures that allow migration, and prevent trapping and/or killing vernal pool dependent wildlife. Based on a review of the Project activities, use of BMPs, and adherence to permit conditions, no direct effects to vernal pools are anticipated.

[1] Indicator species include spotted salamander, wood frog, marbled salamander, blue-spotted salamander, Jefferson salamander, eastern spadefoot toad, and fairy shrimp.

Indirect, or secondary, effects are not anticipated at any vernal pool because there is no required tree clearing or vegetation removal in the ROW proximate to the potential vernal pools. Forested cover in proximity to all of the potential vernal pools would remain intact, such that non-breeding season habitat suitability outside of the vernal pools would remain consistent with existing conditions. A recent study in Maine assessed the wood frog and spotted salamander egg mass abundance in vernal pools on and off managed ROWs and found that the ROWs conditions did not prohibit the presence of breeding vernal pool species and that ROW creation and maintenance should not be considered incompatible with vernal pool habitat preservation.[2] A 2012 study in the northeast looked at vernal pools on, within or adjacent to utility ROWs and found that vernal pool wildlife and amphibian egg masses were abundant in pools along the ROWs.[3]

FEMA Flood Zones and Floodways

Portions of the Project are located within the 100-year flood zones for Candlewood Hill Brook, Mill Creek and Turkey Hill Brook. No permanent or temporary structures or other Project facilities are proposed to be located within the FEMA-mapped floodway for a 100-year flood event.

One structure replacement (structure 4445) will occur within the 100-year flood zone. The replacement of structure 4445 in the 100-year floodplain would not result in any net change in flood storage capacity or associated flood elevations since the existing structure 4445 would be removed and replaced with a new pole structure that would be substantially equivalent to the existing structure in terms of base size and diameter. The temporary work pad for structure 4445 is also located within the 100-year floodplain of Candlewood Hill Brook and a portion of the temporary work pad for structure 4412 is located within the 100-year floodplain of Mill Creek. A small area of construction matting within the existing access road to structure 4409 is located

[2] Duncan, C.P., A. Finamore, A. Slayton, and K. Marcoux. 2012. Vernal pool occurrence and species distribution within transmission Rights-of-Way in Maine. Abstract accepted for the Tenth Symposium on Environmental Concerns in Right-of-Way Management.

[3] Donohue, S., M. Tyrrell, and T. Doyle. 2012. Important Considerations for Utility Right-of-Way Selection, Routing, and Vernal Pool Management. In Proceeding of the Ninth International Symposium on Environmental Concerns in Rights-of-Way Management. (J. W. Goodrich-Mahoney, D. Mutrie, and J, Reinemann, Eds.).

within the 100-year floodplain of Turkey Hill Brook. The installation of these temporary construction mats is not anticipated to have an adverse effect on the hydraulic characteristics of the flood zones, including flood storage capacity or associated flood elevations, due to the relative size of the flood zones and the temporary placement of the mats followed by the immediate removal once construction is complete.

Eversource would utilize its BMPs to minimize any impacts in these areas including the use of construction mats for access roads and work pads within flood zones (no new permanent access roads or work pads within flood zones are proposed), to ensure that hydrology is not adversely affected. All construction mats would be removed after the Project is complete. Areas of disturbance would be promptly stabilized in order to minimize the potential for soil erosion and the flow of sediments into nearby resource areas. Prior to forecasted significant storm events, Eversource will secure the construction mats to prevent lateral movement during any potential flood events.

Water Supply

No public water supply reservoirs, public water supply wells or aquifer protection areas are located in the vicinity of the Project area and the Project would not affect surface water supply resources. Scovill Reservoir is located to the south of the ROW in close proximity to structures 4437 through 4439, but this surface water is a not a drinking/potable water supply.

Wildlife and Habitat

Eversource reviewed the CT DEEP, NDDB for state-listed endangered, threatened, or special concern species in the vicinity of work activities. A small portion of the Project near Beaver Meadow Road and Turkey Hill Road, within the access roads and work pad locations of structures 4409 through 4411, is located within a NDDB mapped habitat area. In addition, a small portion of the Project near Old Cart Road near structure 4397 and the access road off Smith Hill Road is located within a NDDB mapped habitat area. The area of NDDB mapped habitat located east of the Haddam Substation is not located within the ROW for the Project area.

Eversource will submit an NDDB State-listed Species Review request to the NDDB to review the proposed Project and identify the state-listed species potentially present. Eversource will work with the CT DEEP NDDB to identify protection measures for the listed species and critical habitat area as appropriate for implementation during construction to avoid and minimize potential impacts to the species.

In addition to coordinating with the CT DEEP NDDB for state-listed species, Eversource has conducted a review of the United States Fish and Wildlife ("USFWS") Information for Planning and Conservation ("IPaC") as part of the Section 7 consultation process that is required for the Project's ACOE Connecticut General Permit authorizations, which Eversource expects to file in December of 2016. The USFWS IPaC Resource Report indicates one federal-listed species consisting of the Northern Long-eared Bat (*Myotis septentrionalis*) is present with potential habitat designated throughout the State of Connecticut. However, no tree clearing is proposed as part of this Project, therefore no impacts to bats are anticipated. Eversource would continue to consult with the appropriate agencies to ensure that measures are undertaken to minimize the Project's potential impact to these species.

Visual Effects

Visual effects would be limited to the change from wood to weathering steel and the amount of vegetation removal that would be required to accommodate the structure replacements. New structures are proposed to be located in line and within 10 feet of the existing structure locations. Depending on location, the height of the proposed structures would generally be would be approximately 2 to 16 feet taller than the existing structures and six structures will remain the same height. The height difference is not anticipated to result in a significant change to the visual effect.

Sound Levels along the Transmission ROW

There would be no changes to the sound levels along the transmission ROW after completion of the Project.

Radio and Television Interference

No radio or television interference would result from the Project.

6. Traffic, Construction Sequence and Methods

Traffic/Traffic Management

Construction vehicles and equipment associated with the work would include pickup trucks, bucket trucks, concrete trucks, drill rigs, front loaders, reel trailers, bulldozers, wood chippers, cranes, forklifts, side booms, dump trucks and cranes. Construction-related vehicular and equipment movements would occur on public roads in the Project area. However, the Project-related traffic is generally expected to be temporary and highly localized in the vicinity of the ROW and staging areas. Due to phasing of construction work, these Project-related traffic movements are not expected to significantly affect transportation patterns or levels of service on public roads.

To safely move construction vehicles and equipment onto and off of the ROW while minimizing disruptions to vehicular traffic along public roads, Eversource or its Project contractor would, as appropriate, work with the Connecticut Department of Transportation to develop and implement traffic management procedures, as needed. The construction contractor is typically responsible for posting and maintaining construction warning signs along public roads near work sites and for coordinating the use of flaggers or police personnel to direct traffic, as necessary.

Construction Sequence

Preparation of the ROW would include the following activities:

Establishing Staging Areas

Temporary staging areas will be selected from available parcels in the vicinity of the Project area and would be used to store construction materials, equipment, tools, and supplies (including insulators, hardware, poles and construction mats) for the Project. Office trailers may be located at a staging area, and components removed during the work (structures, hardware and insulators) may be temporarily accumulated and stored at a staging area prior to removal off-site for salvage and/or disposal. The staging areas may also be used by construction crew members for parking personal vehicles as well as for construction vehicles and equipment storage, and for performing minor maintenance, when needed, on construction equipment. An environmental review of each potential staging area location would be completed and erosion and sedimentation

("E&S") controls would be installed and maintained until Project completion in accordance with Eversource's BMPs.

Eversource would consult with the local municipal officials and provide notice to the Council when staging areas are identified.

Clearing and Vegetation Removal

As previously stated, no clearing would be required for this Project. The ROW is currently maintained in accordance with Eversource's ROW vegetation management program and clearing is not required. However, some vegetation removal would be required within construction areas, including within existing access roads. Eversource would conduct vegetation removal activities in accordance with its BMPs.

During vegetation removal, construction mats will be used to provide a stable base for equipment across watercourses or within wetlands. Such temporary support would minimize rutting in wetlands and would be removed after the vegetation removal activities are completed.

Eversource would require the contractor to use low-impact mowing/vegetation removal methods, where possible, to maintain vegetation and to protect wetlands, watercourses, threatened and endangered species and their habitats, and cultural resources. Low-impact mowing/vegetation removal incorporates a variety of approaches, techniques, and equipment to minimize site disturbance. Eversource would require the contractor to use such low-impact methods, depending on site-specific considerations, as:

- Take into consideration soil and weather conditions when scheduling vegetation removal activities such as heavy rainfall.
- Maximize the use of uplands for access routes.
- Use appropriate equipment for the site conditions to minimize impacts to the extent practicable.
- Cut shrubs close to the ground, leaving root systems and stumps, where practical, to provide additional soil stability.

Soil Erosion and Sediment Control Installation

Project construction would conform to best management practices for erosion and sedimentation ("E&S") control, including those provided in the *2002 Connecticut Guidelines for Soil Erosion and Sediment Control* ("*CT Guidelines*") and Eversource's BMPs.

Typical E&S control measures include, but are not limited to, straw blankets, hay bales, silt fencing, check dams, berms, swales, and sediment basins. Silt fence would be installed prior to construction to demarcate the line of construction and prevent migration of sediment or construction materials into wetlands and watercourses. Temporary E&S control measures would be maintained and inspected throughout the Project to ensure their integrity and effectiveness. Following completion of construction, seeding and mulching would occur to permanently stabilize previously disturbed areas. The temporary E&S control measures would remain in place until the Project work is complete and all disturbed areas have been stabilized.

Access Roads and Work Pads

Access to each proposed transmission structure location is required for Project construction. As a result of the operation and maintenance of the existing transmission lines within this ROW, most access roads were already established and were improved to provide access for the equipment necessary to perform the emergency steel arm replacements. No new, permanent access roads will be required, however; construction matting will be necessary to construct temporary access roads through wetland areas to reach certain structure locations. Additionally, existing off-ROW access roads, some requiring improvement, would be utilized to access the Project ROW. The access roads expected to be used for the proposed Project are illustrated on the maps in Attachment A.

The existing access roads may need to be graded, widened, and/or reinforced with additional material in order to accommodate the safe passage of construction vehicles and equipment. Access road improvements typically include trimming adjacent vegetation and widening roads as needed to provide a minimum travel surface that is approximately 16 to 20 feet wide (additional width may be needed at turning or passing locations). Access roads would typically be graveled; however, where access roads

traverse streams or wetlands, construction mats would be used. E&S controls would be installed as necessary before the commencement of any improvements to or development of access roads.

At each transmission line structure site, a work pad is required to stage material for final on-site assembly and/or removal, and to provide a safe, level work base for the construction equipment. Typical work pads would be approximately 100 feet by 100 feet.

The preliminary locations and configuration of the work pads, as determined based on the environmental field studies and constructability reviews, are shown on Attachment A.

A typical (upland) installation of a work pad at a structure location involves several steps, and include to the extent necessary: (1) removal of vegetation, (2) the work pad site would be graded to create a level work area, and (3) the upper three to six inches of topsoil (which is typically unsuitable to support the necessary construction activities) would be removed. The topsoil would be temporarily stockpiled within the ROW, typically near the work pad. A rock base, which allows drainage, would be layered on top of filter fabric. Additional layers of rock with dirt/rock fines are typically placed over this rock base.

To facilitate transmission line maintenance, work pads in upland areas would be left in place, unless the property owner requests that they be removed. Access roads and work pads located within improved areas would typically be removed and restored unless the property owner requests that they remain in place. No new permanent access roads or work pads are proposed in wetlands or streams.

Foundation Work

Following the installation of the work pads, drilled shaft installation would be used for the direct embedment foundation technique. Structure foundation work would require equipment such as: augers, drill rigs, cranes, and dump trucks. All direct embedment structures require crushed rock backfill. When groundwater is encountered, particularly within wetlands, pumping (vacuum) trucks or other suitable equipment would be used to pump water from the excavated areas as the foundation is being installed or the

structure is being set. The water would then be discharged in accordance with applicable local, state, and federal requirements.

Depending on site-specific soil conductivity, supplemental grounding (counterpoise) will be installed at this time. A Quad-ditch witch plow-cable trencher would be used to install the counterpoise.

Excavated soils that are generated during construction activities would not be stored or stockpiled inside of a wetland, or adjacent to a watercourse. Materials that could not be utilized as back fill would be disposed of in accordance with the *CT Guidelines,* the Eversource's BMPs and the applicable regulations.

Structure Assembly/Installation

After the foundations have been installed, the new structures would be assembled. Sections of the new structures, structure components and hardware would be delivered to the individual structure locations using flat-bed trucks and assembled on-site using a crane and bucket trucks.

Removal of Existing Structures

Eversource plans to remove the entire pole (above and below grade) at each location. Structures where the removal of the below grade structure (pole butts) may cause significant disturbance (such as in wetland areas) or impact the integrity of the replacement are evaluated on a site by site basis. Pole butts that cannot be removed are left in place and cut to 10 inches above grade. All pole butt holes in upland locations are backfilled and compacted (every three feet) with appropriate fill material.

Restoration

ROW restoration activities would include the removal of construction debris, signage, flagging, and temporary fencing, as well as the removal of construction mats and work pads. Areas affected by construction would be re-graded as practical and stabilized using revegetation or other measures before removing temporary E&S controls.

Waste Management

Waste materials, such as structure components (i.e., steel from the existing structures, conductor, shield wire, associated hardware, excess concrete, etc.) and any other construction debris would be disposed of in accordance with Eversource's BMPs, applicable regulations or recycled consistent with applicable rules and regulations and Eversource policies.

Excess soils and dewatering waters would be managed in accordance with the *CT Guidelines,* the Eversource BMPs, applicable regulations and/or disposal facility policies.

Noise

During construction, any impacts to existing noise levels would be short-term and localized in the vicinity of the work sites. There would be no permanent changes to the noise levels along the transmission ROW from the Project.

Construction Schedule and Work Hours

Normal working hours would be Monday through Saturday from 7:00 AM to 7:00 PM, while daylight permits. Sunday working hours may be required during transmission line outages or due to delays caused by inclement weather. Multiple crews may work concurrently on different sections of the line.

7. Electric and Magnetic Fields

Eversource prepared calculations of the existing and post-Project Electric and Magnetic fields ("EMF"). The calculations were based on average annual loading conditions, because these are most representative of typical operating conditions. The calculations are made relative to the proposed centerline of the transmission lines. The calculations apply at one meter (3.28 feet) above grade, and assume that the lowest conductor for each 115-kV circuit is 30 feet above grade.

Eversource's proposed design for the Project employs a double-circuit vertical configuration of six phase conductors (three phases per circuit) supported on tubular weathering steel poles.

Between Haddam Substation and Haddam Junction magnetic fields are projected to increase by 0.2 milligauss (mG) along the south edge of the ROW during annual average loading conditions when compared to the current transmission line configuration. The magnetic field level along the north edge of this section of ROW is projected to decrease by 0.2 mG.

Between Haddam Junction and Oxbow Junction the magnetic field levels at the north and south edges of the ROW are projected to decrease during annual average loading conditions when compared to the current transmission line configuration. A reduction of 0.5 mG is projected along the north ROW edge. A reduction of 2.6 mG is projected along the south ROW edge.

Electric fields levels are projected to increase slightly along the north edge of each section of ROW (Haddam Substation to Haddam Junction and Haddam Junction to Oxbow Junction) when compared to the existing configuration. Electric field levels at and beyond the south edge of each section of ROW would remain essentially unchanged.

Table 1 summarizes the calculated electric and magnetic fields at the ROW edges before and after the modifications.

Table 1 - Summary of Calculated Electric and Magnetic Fields

Haddam Substation To Haddam Jct

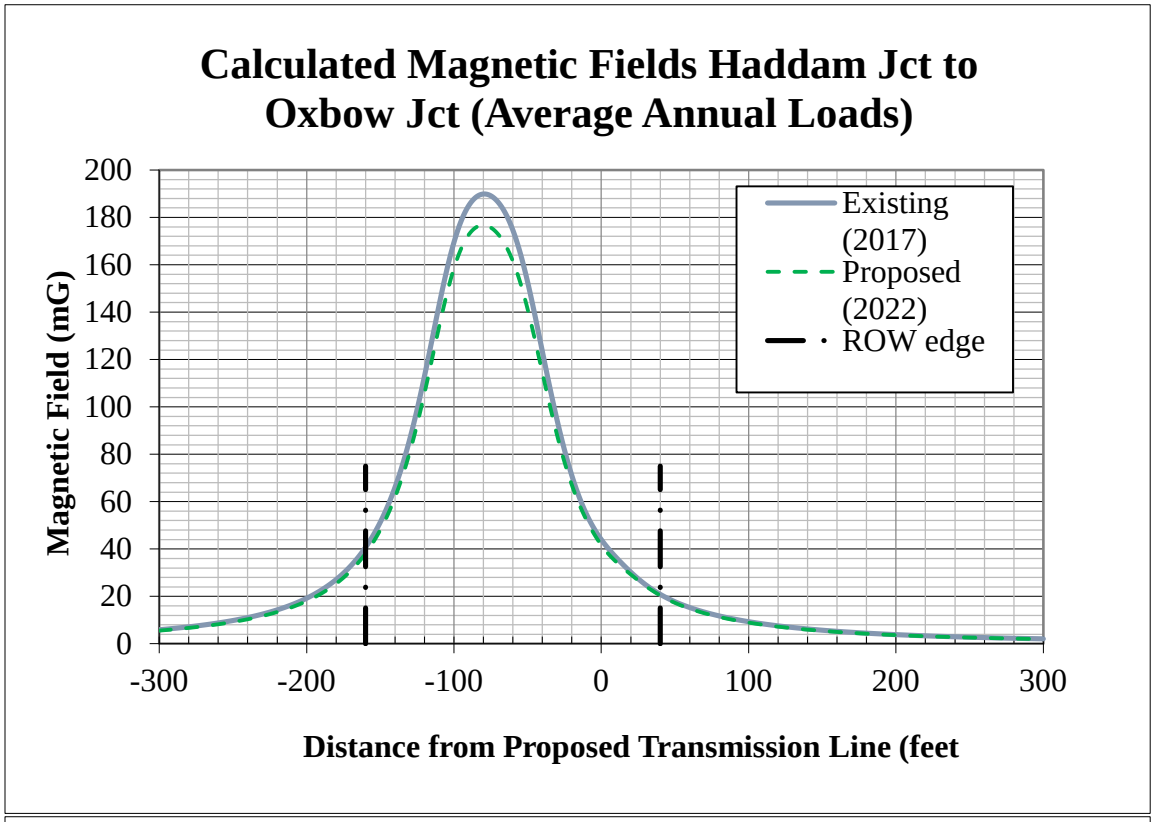
Summary of Fields		1620-1975 ROW EMF Calculations		
		South Edge	Max	North Edge
MF (mG)	Pre	11.4	190.2	21.5
	Post	11.6	177.1	21.3
EF (kV/m)	Pre	0.12	4.72	0.16
	Post	0.12	4.72	0.25

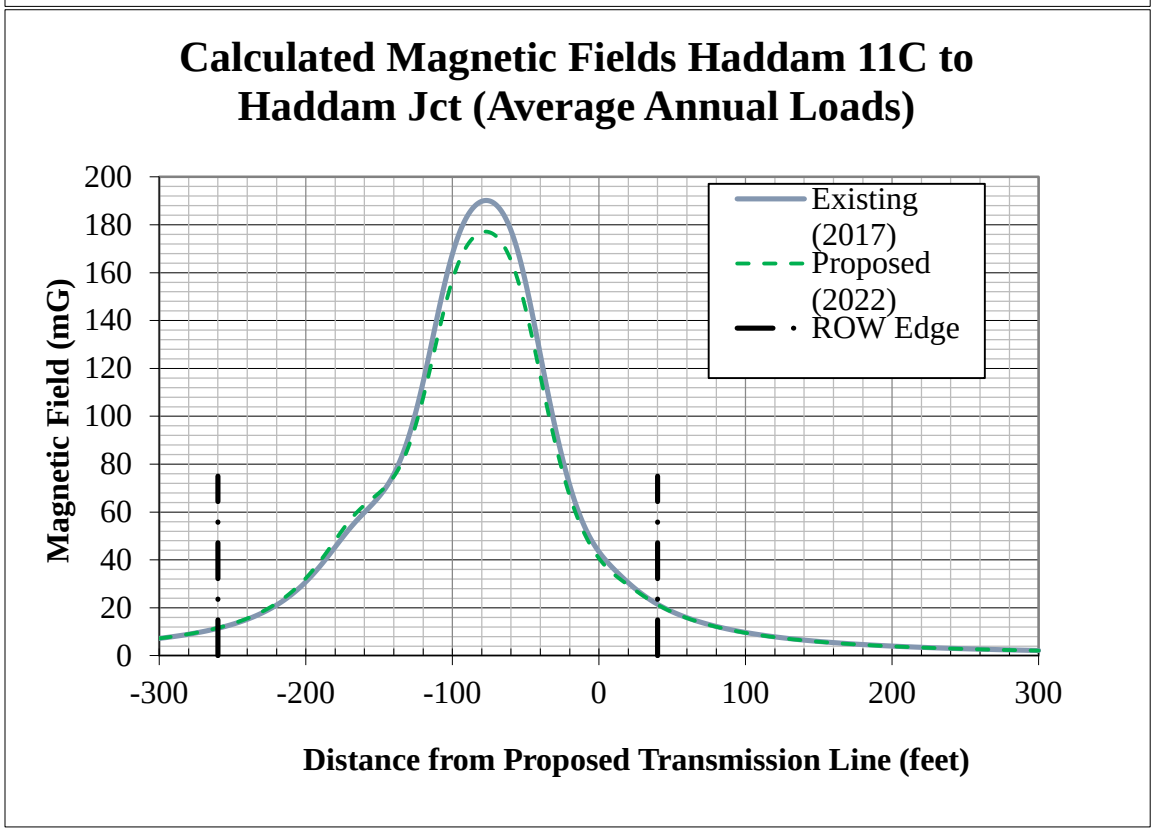
Haddam Jct To Oxbow Jct

Summary of Fields		1620-1975 ROW EMF Calculations		
		South Edge	Max	North Edge
MF (mG)	Pre	40.7	189.9	20.9
	Post	38.1	176.7	20.4
EF (kV/m)	Pre	1.31	4.95	0.17
	Post	1.31	4.95	0.26

The results of the calculations show that the proposed modifications would not substantially increase electric or magnetic fields at the edge of the ROW. In fact, magnetic fields would decrease at the edges of the ROW for the Haddam Junction to Oxbow Junction section. See Figure 2: EMF Graphs.

Figure 2 EMF Graphs





Comparison of Calculated Fields to International Guidelines

The anticipated fields from the proposed transmission lines are well below the internationally established exposure limits for 60-Hz electric and magnetic fields identified by the International Council on Electromagnetic Safety ("ICES") and the International Council on Non-Ionizing Radiation Protection ("ICNIRP"). These standards are summarized below in Table 2.

Table 2 - International Guidelines for EMF Exposure

	EF (kV/m)	MF(mG)
ICES	5	9,040
ICNIRP	4.2	2000

8. Municipal and Property Owner Outreach

Prior to submitting the Petition, Eversource notified municipal officials in Haddam. Eversource provided an overview of the Project, the need for the Project, and provided a point of contact to obtain additional information. In conjunction with the submission of the Petition, all abutting property owners were notified of the filing and provided information on how to submit comments to the Council and how to obtain additional information on the Project. In addition, Eversource representatives will contact adjacent residents via mail to notify them of the start of construction activities. Project representatives will also be available throughout the construction process to address any specific questions or concerns regarding the Project. Eversource proposes to begin construction November 2016 and completed by the end of May 2017. Restoration is scheduled for the spring of 2017.

9. Section 16-50k(a) of the Connecticut General Statutes provides that a Certificate of Environmental Compatibility and Public Need is needed for proposed modifications of a facility that the Council determines would have a "substantial adverse environmental effect." Eversource respectfully submits that the proposed modifications would not result in a substantial adverse effect on the environment or ecology, nor would they damage existing scenic, historical or recreational values. Accordingly, Eversource requests that the Council issue a declaratory ruling that the proposed modifications would have no substantial adverse environmental effect and, therefore, no Certificate is required.

10. Communications regarding this Petition for a Declaratory Ruling should be directed to:

Kathleen M. Shanley
Manager – Transmission Siting
Eversource Energy
PO Box 270
Hartford, CT 06141-0270
Telephone: (860) 728-4527

By: _____
Kathleen M. Shanley
Manager – Transmission Siting

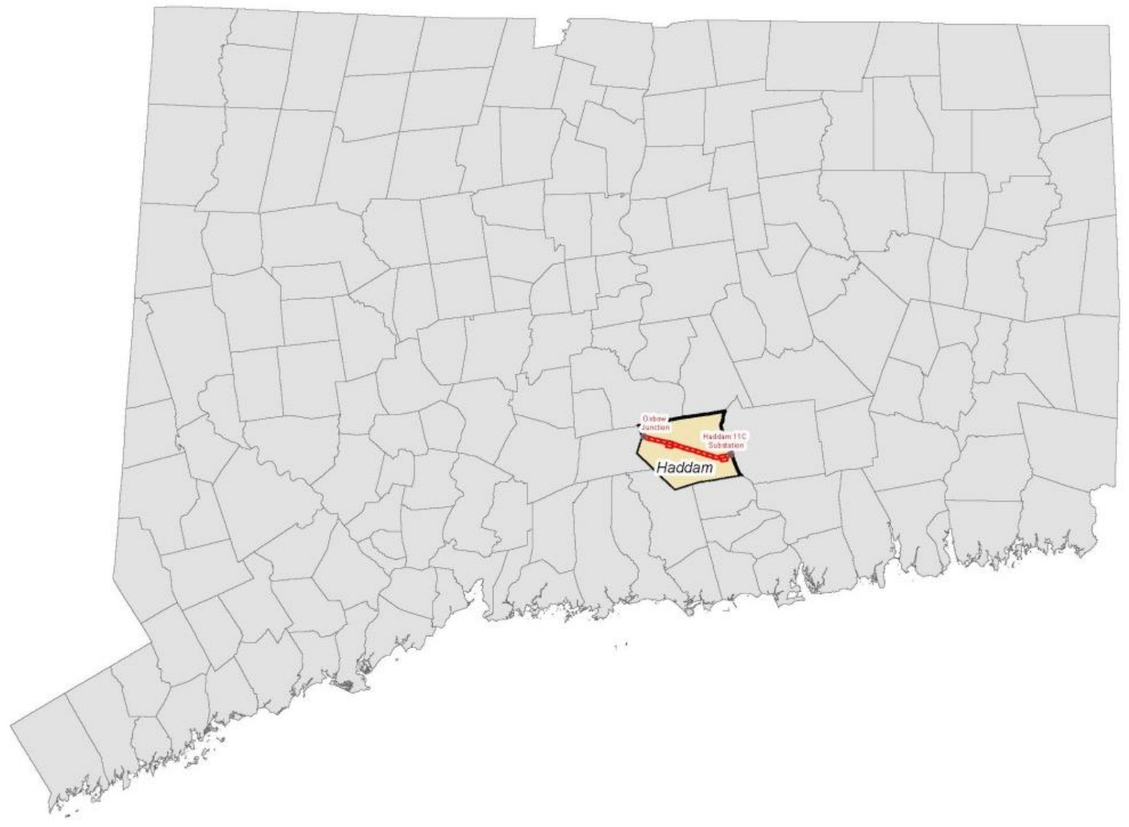
List of Attachments

Attachment A: 1620/1975 Lines Structure Replacement Project
Attachment B: Existing/Proposed ROW Cross Sections
Attachment C: Wetlands and Watercourses Report
Attachment D: Vernal Pool Survey Technical Memorandum
Attachment E: Letter to the Abutters and Affidavit

Attachment A
1620/1975 Lines Structure Replacement Project Maps

EVERSOURCE

1620/1975 LINES STRUCTURE REPLACEMENT PROJECT



Town of Haddam, Connecticut
September 2016

MIDDLETOWN

EAST HADDAM

HADDAM

DURHAM

KILLINGWORTH

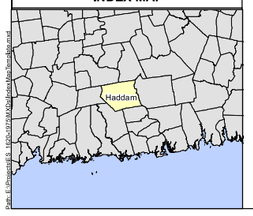
Oxbow Junction

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

Haddam 11C Substation

CONNECTICUT RIVER

INDEX MAP



Legend

- Junction
- Substation
- Mapsheet
- Municipal Boundaries

N W E S

1 inch = 2,000 feet

0 1,200 2,400 4,800 Feet

EVERSOURCE

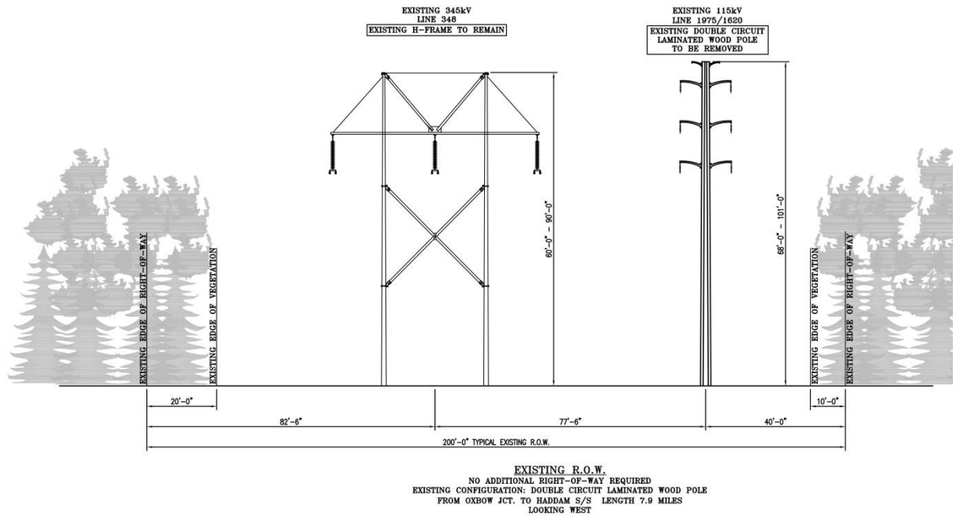
1620/1975 Lines
Structure Replacement Project
Index Map

Haddam, CT

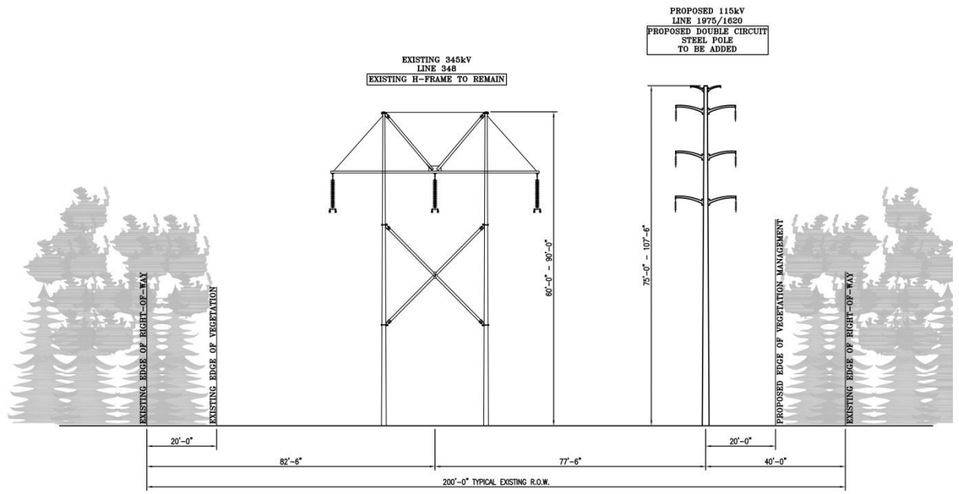
Date: 9/21/2016

AECOM

MAPSHEET 01 of 17
1620/1975 Lines Structure Replacement Project
Replacement Structures 4455 to 4460
Haddam, Connecticut



EXISTING R.O.W.
NO ADDITIONAL RIGHT-OF-WAY REQUIRED
EXISTING CONFIGURATION: DOUBLE CIRCUIT LAMINATED WOOD POLE
FROM OXBOW JCT. TO HADDAM S/S LENGTH 7.9 MILES
LOOKING WEST



PROPOSED R.O.W.
PROPOSED CONFIGURATION: DOUBLE CIRCUIT STEEL POLE
FROM OXBOW JCT. TO HADDAM S/S LENGTH 7.9 MILES
LOOKING WEST

Line List No.	Owner Name (Now or Formerly)	Property Address
100	Connecticut Light & Power d/b/a Eversource Energy	Oxbow Road
101	Diane W. Andrews and Janice Kadrle	334 Oxbow Road
102	Ronald W. Klienschmidt	338 Oxbow Road
103	William & Nancy Ann Klienschmidt	340 Oxbow Road
111	Conn State of Municipal Division	Brainard Hill Road

AREA DESCRIPTION

Existing Adjacent Land Use

- Undeveloped, forested
- Menunketesuck-Cockaponset Regional Greenway - crosses ROW
- Recreational / open space (Cockaponset State Forest)
    - Cockaponset Forest Trail and other unnamed trails

RIGHT-OF-WAY DESCRIPTION

Right-of-Way Land Use

- Maintained electric transmission facilities corridor
- Recreational / open space (Cockaponset State Forest)
- Menunketesuck-Cockaponset Regional Greenway - crosses ROW

Water Resources

- Wetlands 1, 2, 5 and 6
- Wetland cover types – PEM/PFO, PSS, PEM/PSS
- Wetland 5 cover type = PSS
- Watercourses – Waterbody S1 (Bible Rock Brook) and S2

Wetland and Watercourse Crossings

- Wetland 5 – temporary construction mats for work pad at structure 4457

Right-of-Way Vegetation

- Scrub-shrub
- Herbaceous
- Forested

Access

- Structures 4455 to 4458: from existing ROW access road off of Oxbow Road
- Structures 4459 to 4460/14060: off-ROW access from Oxbow Road

Existing Maintained Right-of-Way Width

- 200 feet

HADDAM

LLN# 103
WILLIAM & NANCY
ANN KLEINSCHMIDT

LLN# 102
RONALD W.
KLEINSCHMIDT

LLN# 101
DIANE W. ANDREWS
& JANICE KADRLE

LLN# 100
CONN LIGHT AND POWER CO
D/B/A EVERSOURCE ENERGY

LLN# 111
CONN STATE OF
MUNICIPAL DIV.

LLN# 111
CONN STATE OF
MUNICIPAL DIV.

STR 28020
STR 14057
STR 28021
STR 14058
STR 14059
STR 14060
STR 4460
STR 4459
STR 4458
STR 4457
STR 4456
STR 4455
STR 9884
STR 9883
STR 9882
STR 9881
STR 9880
STR 9879

Oxbox Junction
Oxbow Rd
Helco Lighting Road Gated

Bible Rock Brook
FLOW
FLOW
FLOW

Wetland 1
Wetland 2
Wetland 3
Wetland 4
Wetland 5
Wetland 6

S1
S1-A
S2

Temporary Wetland Impacts of:
2,160 square feet

Cockaponset Forest Trail
Cockaponset Forest Trail

Stepanski Pond

Match Line Page 2

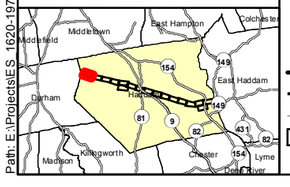
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

STR#	DESCRIPTION	HEIGHT (FT)	FINISH	FOUNDATION
14060	STEEL H-FRAME (3 POLE)	65/65/65	WEATHERING STEEL	DRILLED SHAFT
4460	STEEL H-FRAME (3 POLE)	65/65/70	WEATHERING STEEL	DRILLED SHAFT
4459	STEEL MONOPOLE	110	WEATHERING STEEL	DRILLED SHAFT
4458	STEEL MONOPOLE	100	WEATHERING STEEL	DRILLED SHAFT
4457	STEEL H-FRAME (2 POLE)	105/105	WEATHERING STEEL	DRILLED SHAFT
4456	STEEL MONOPOLE	110	WEATHERING STEEL	DRILLED SHAFT
4455	STEEL MONOPOLE	105	WEATHERING STEEL	DRILLED SHAFT

WORK AREA BOUNDARIES IN / NEAR WETLANDS:
1. VEGETATION REMOVAL WILL OCCUR WITHIN THE EXISTING RIGHT-OF-WAY LIMITS AS SHOWN. ADDITIONALLY, DANGER OR HAZARD TREE REMOVAL MAY BE REQUIRED OUTSIDE OF THE VEGETATION REMOVAL LIMITS.
2. ALL PROJECT CONSTRUCTION ACTIVITIES WILL BE CONTAINED WITHIN THE DEPICTED APPROXIMATE LIMIT OF DISTURBANCE ASSOCIATED WITH WORK PADS AND ACCESS ROADSWORK AREA BOUNDARIES IN / NEAR WETLANDS

GENERAL NOTES
1. THE LIMITS OF DISTURBANCE AS SHOWN DEFINE AREAS WHERE VEGETATION REMOVAL AND GRUBBING, GRADING, AND EXCAVATION MAY OCCUR
2. ALL WORK WILL BE CONDUCTED IN ACCORDANCE WITH THE RELEVANT PORTIONS OF EVERSOURCE'S BMP MANUAL: CONNECTICUT CONSTRUCTION AND MAINTENANCE ENVIRONMENTAL REQUIREMENTS (BMP MANUAL), UNLESS MORE STRINGENT PROJECT-SPECIFIC MEASURES APPLY.
3. ALL WORK WILL BE CONDUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF REGULATORY APPROVALS FROM THE CONNECTICUT SITING COUNCIL, U.S. ARMY CORPS OF ENGINEERS AND THE CONNECTICUT DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION, AND WITH ALL PROJECT PROTOCOLS.
4. EROSION AND SEDIMENTATION CONTROL MEASURES WILL BE INSTALLED DURING CONSTRUCTION, AS REQUIRED, TO COMPLY WITH THE 2002 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL, AND EVERSOURCE'S BMP MANUAL, AND APPLICABLE REGULATORY APPROVALS

INDEX MAP



Legend

- Existing Structure to Remain
- Existing Structure to be Replaced
- Replacement Structure
- Existing Right-of-Way
- Transmission Line to Remain (Approx Centerline)
- 2' Contour Line
- Property Line
- Culvert
- Fence
- Gate
- Delineated Wetland
- Wetland Area
- Delineated Water
- Water Area
- National Hydrography Dataset
- Potential Vernal Pool (PVP) 100' Buffer
- Potential Vernal Pool (PVP)
- FEMA Floodway
- FEMA 100-Year Floodplain
- Construction Work Pad
- Temporary Matting
- Existing Improved Access Road
- Existing Unimproved Access Road
- Approximate Existing Tree Line
- Approximate Limit of Disturbance
- MatchLines
- Municipal Boundary
- Hiking Trails
- CT DEEP Property
- CT DEEP NDDB Area

1 inch = 200 feet
0 50 100 200 Feet

NO.	DATE	REVISIONS	BY	CHK	APP	APP

EVERSOURCE

1620/1975 Lines Structure Replacement Project

Haddam, CT

Map Sheet 1 of 17

9/21/016

AECOM

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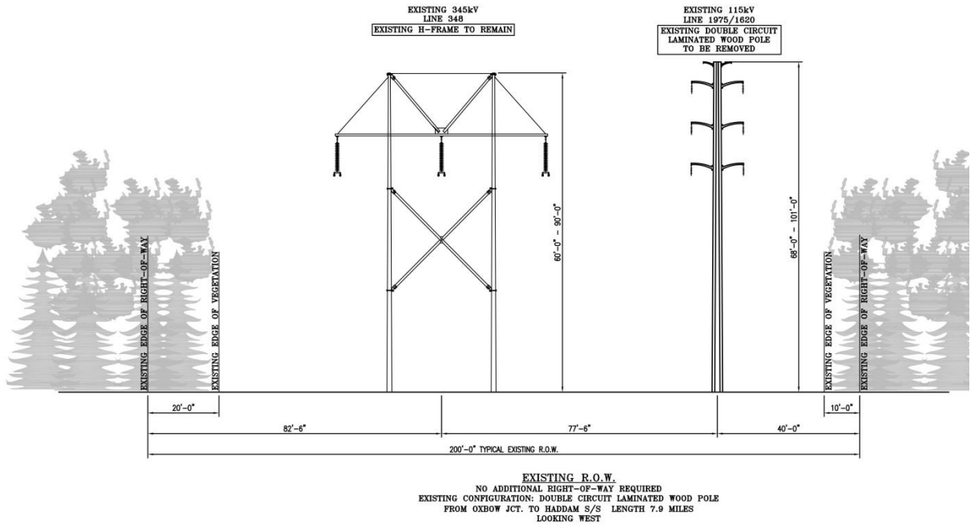
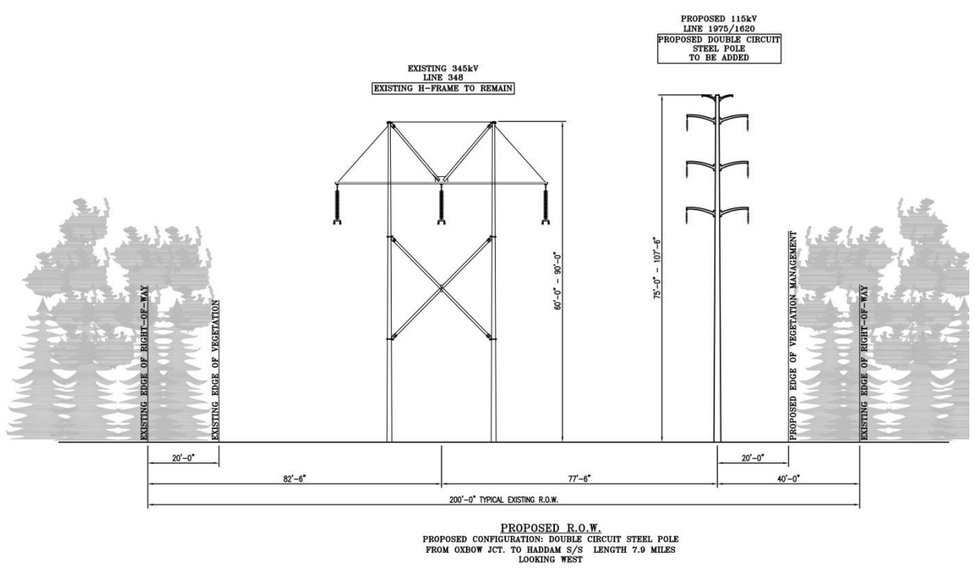
MAPSHEET 02 of 17
1620/1975 Lines Structure Replacement Project
Replacement Structures 4450 to 4454
Haddam, Connecticut





ABUTTERS TO PROJECT RIGHT-OF-WAY		
Line List No.	**Owner Name (Now or Formerly)**	**Property Address**
111	Conn State of Municipal Division	Brainard Hill Road
112	James Bailey & Elvira Dagostino-Bailey	Candlewood Hill Road

AREA DESCRIPTION

Existing Adjacent Land Use

- Undeveloped, forested
- Menunketesuck-Cockaponset Regional Greenway – crosses ROW
- Blue Blazed Trail System Greenway (Mattabesett Trail) – crosses ROW
- Recreational / open space (Cockaponset State Forest)
    - Cockaponset Forest Trail and other unnamed trails
    - Mattabesett Trail (Eagle Beak Section; New England National Scenic Trail) – crosses ROW

Road Crossings

- None

RIGHT-OF-WAY DESCRIPTION

Right-of-Way Land Use

- Maintained electric transmission facilities corridor
- Undeveloped, forested
- Menunketesuck-Cockaponset Regional Greenway – crosses ROW
- Blue Blazed Trail System Greenway (Mattabesett Trail) – crosses ROW
- Recreational / open space (Cockaponset State Forest)

Scenic Resources

- Mattabesett Trail (Eagle Beak Section; New England National Scenic Trail) – crosses ROW

Water Resources

- Wetlands 7, 8, 9, 10, and 11
- Wetland cover types – PEM, PSS, PEM/PSS
- Watercourses – None
- Potential Vernal Pool 1 (associated with Wetland 10)

Wetland and Watercourse Crossings

- None

Right-of-Way Vegetation

- Scrub-shrub
- Herbaceous
- Forested

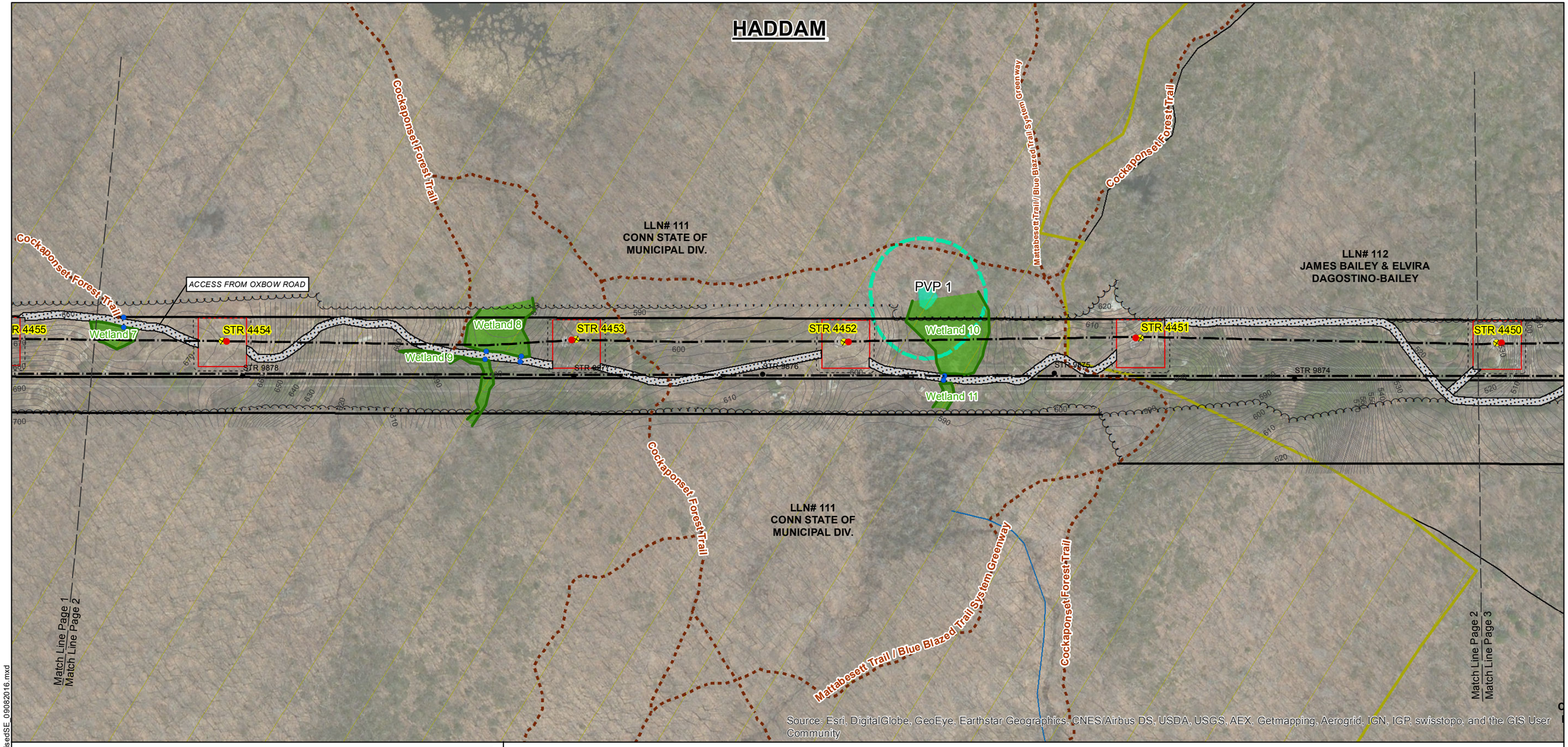
Access

- Structures 4450 to 4454: from existing ROW access road off of Oxbow Road

Existing Maintained Right-of-Way Width

- 200 feet

HADDAM



STR#	DESCRIPTION	HEIGHT (FT)	FINISH	FOUNDATION
4454	STEEL MONOPOLE	105	WEATHERING STEEL	DRILLED SHAFT
4453	STEEL MONOPOLE	110	WEATHERING STEEL	DRILLED SHAFT
4452	STEEL MONOPOLE	100	WEATHERING STEEL	DRILLED SHAFT
4451	STEEL MONOPOLE	115	WEATHERING STEEL	DRILLED SHAFT
4450	STEEL MONOPOLE	90	WEATHERING STEEL	DRILLED SHAFT

WORK AREA BOUNDARIES IN / NEAR WETLANDS:
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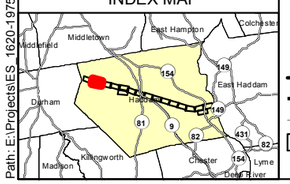
INDEX MAP



Legend

- Existing Structure to Remain
- Existing Structure to be Replaced
- Replacement Structure
- Existing Right-of-Way
- Transmission Line to Remain (Approx Centerline)
- 2' Contour Line
- Property Line
- Culvert
- Fence
- Gate
- Delineated Wetland
- Wetland Area
- Delineated Water
- Water Area
- National Hydrography Dataset
- Potential Vernal Pool (PVP) 100' Buffer
- Potential Vernal Pool (PVP)
- FEMA Floodway
- FEMA 100-Year Floodplain
- Construction Work Pad
- Temporary Matting
- Existing Improved Access Road
- Existing Unimproved Access Road
- Approximate Existing Tree Line
- Approximate Limit of Disturbance
- MatchLines
- Municipal Boundary
- Hiking Trails
- CT DEEP Property
- CT DEEP NDDB Area

1 inch = 200 feet

0 50 100 200 Feet

NO.	DATE	REVISIONS	BY	CHK	APP	APP

EVERSOURCE

1620/1975 Lines Structure Replacement Project

Haddam, CT

Map Sheet 2 of 17

9/21/2016

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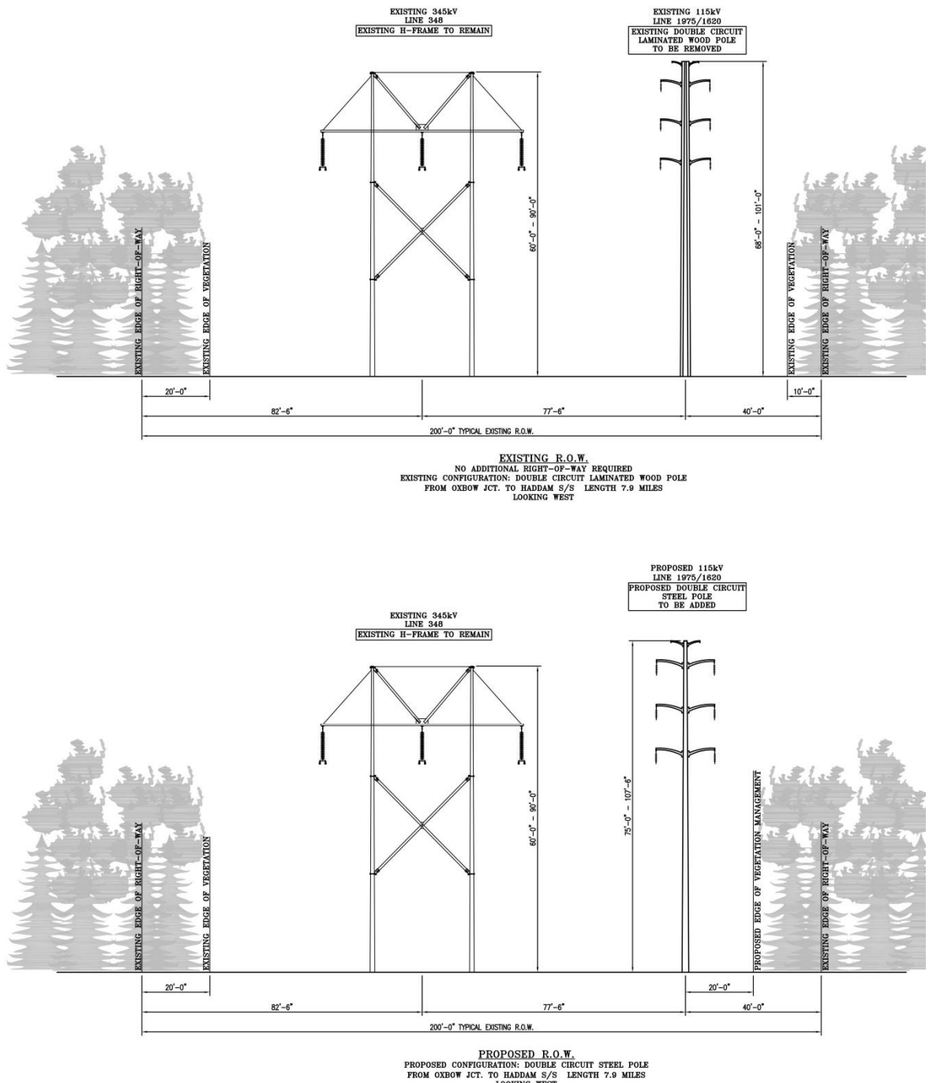
MAPSHEET 03 of 17
1620/1975 Lines Structure Replacement Project
Replacement Structures 4446 to 4449
Haddam, Connecticut



ABUTTERS TO PROJECT RIGHT-OF-WAY		
Line List No.	**Owner Name (Now or Formerly)**	**Property Address**
111	Conn State of Municipal Division	Brainard Hill Road
112	James Bailey & Elvira Dagostino-Bailey	Candlewood Hill Road
113	Michael D Macneil	432 Candlewood Hill Road
114	Richard B & Deborah A Hajek	Candlewood Hill Road
115	Tracy Degennaro	412 Candlewood Hill Road

AREA DESCRIPTION

Existing Adjacent Land Use

- Undeveloped, forested
- Menunketesuck-Cockaponset Regional Greenway – crosses ROW
- Residential
- Livestock pasture

Road Crossings

- None

RIGHT-OF-WAY DESCRIPTION

Right-of-Way Land Use

- Maintained electric transmission facilities corridor
- Undeveloped, forested
- Menunketesuck-Cockaponset Regional Greenway – crosses ROW
- Livestock pasture

Water Resources

- Wetlands 12, 13 and 14
- Wetland cover types – PEM/PSS/PFO, PSS, PEM
- Watercourses – Waterbody S3 and S3A
- 100-year floodplain of Candlewood Hill Brook

Wetland and Watercourse Crossings

- Watercouse S3 and S3A – temporary stream crossing BMPs for access road

Right-of-Way Vegetation

- Scrub-shrub
- Herbaceous
- Forested
- Livestock pasture (maintained)

Access

- Structure 4446 to 4448: from existing ROW access road off of Candlewood Hill Road
- Structure 4449: from existing ROW access road off of Oxbow Road

Existing Maintained Right-of-Way Width

- 200 feet

HADDAM

LLN# 112
JAMES BAILEY & ELVIRA
DAGOSTINO-BAILEY

LLN# 114
RICHARD B. &
DEBORAH A. HAJEK

LLN# 115
TRACY M.
DEGENNARO

ACCESS FROM OXBOW ROAD

LLN# 112
JAMES BAILEY & ELVIRA
DAGOSTINO-BAILEY

Temporary Watercourse Impact of:
64 square feet, 16 linear feet

FLOW

S3-A

S3

FLOW

STR 4449

STR 9873

Wetland 12

STR 4448

STR 9872

STR 4447

STR 9871

STR 4446

STR 9870

Wetland 14

Wetland 13

Active Livestock Pasture

Active Livestock Pasture

Temporary Watercourse Impact of:
168 square feet, 16 linear feet

ACCESS FROM CANDLEWOOD HILL ROAD

LLN# 113
MICHAEL D.
MACNEIL

Match Line Page 2
Match Line Page 3

LLN# 111
CONN STATE OF
MUNICIPAL DIV.

Match Line Page 3
Match Line Page 4

Match Line Page 3

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

STR#	DESCRIPTION	HEIGHT (FT)	FINISH	FOUNDATION
4449	STEEL MONOPOLE	95	WEATHERING STEEL	DRILLED SHAFT
4448	STEEL MONOPOLE	105	WEATHERING STEEL	DRILLED SHAFT
4447	STEEL MONOPOLE	105	WEATHERING STEEL	DRILLED SHAFT
4446	STEEL MONOPOLE	125	WEATHERING STEEL	DRILLED SHAFT

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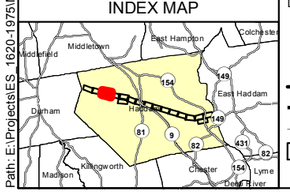
INDEX MAP



Legend

- Existing Structure to Remain
- Existing Structure to be Replaced
- Replacement Structure
- Existing Right-of-Way
- Transmission Line to Remain (Approx Centerline)
- 2' Contour Line
- Property Line
- Culvert
- Fence
- Gate
- Delineated Wetland
- Wetland Area
- Delineated Water
- Water Area
- National Hydrography Dataset
- Potential Vernal Pool (PVP) 100' Buffer
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- Hiking Trails
- CT DEEP Property
- CT DEEP NDDB Area

1 inch = 200 feet
0 50 100 200 Feet

NO.	DATE	REVISIONS	BY	CHK	APP	APP

EVERSOURCE

1620/1975 Lines Structure Replacement Project

Haddam, CT

Map Sheet 3 of 17

9/21/2016

AECOM

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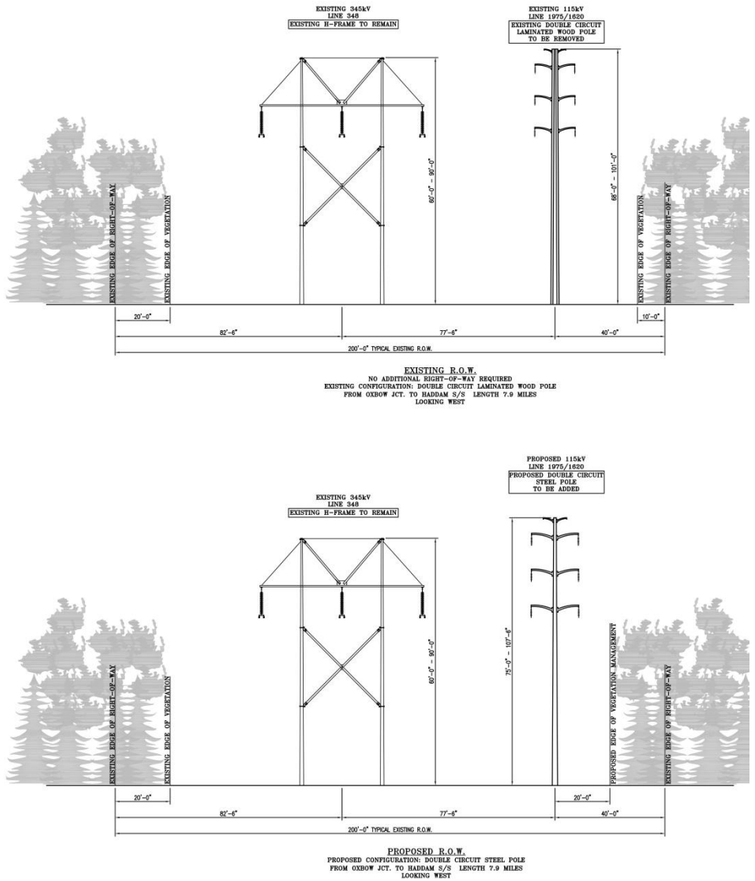
MAPSHEET 04 of 17
1620/1975 Lines Structure Replacement Project
Replacement Structures 4442 to 4445
Haddam, Connecticut



ABUTTERS TO PROJECT RIGHT-OF-WAY		
Line List No.	**Owner Name (Now or Formerly)**	**Property Address**
113	Michael D Macneil	432 Candlewood Hill Road
115	Tracy Degennaro	412 Candlewood Hill Road
116	Jeffrey T. Rummel	62 Jacoby Road
117	Connecticut Light & Power d/b/a Eversource Energy	Candlewood Hill Rd/Jacoby Rd
118	David C. Lougee	36 Jacoby Road
119	Scott Plous	61 Jacoby Road
120	Scott Plous	61 Jacoby Road
121	Thomas A & Regina Shaffer	27 Jacoby Road
122	David & Stephanie A. Bonsall	25 Jacoby Road
123	Michael J Kronenberger	103 Nason Road
124	Raymond Bogdan	103 Nason Road

AREA DESCRIPTION

Existing Adjacent Land Use

- Undeveloped, forested
- Menunketesuck-Cockaponset Regional Greenway – crosses ROW
- Residential
- Livestock pasture
- Waterbody – unnamed private farm pond south of structure 4412

Road Crossings

- Candlewood Hill Road
- Jacoby Road

RIGHT-OF-WAY DESCRIPTION

Right-of-Way Land Use

- Maintained electric transmission facilities corridor
- Undeveloped, forested
- Menunketesuck-Cockaponset Regional Greenway – crosses ROW
- Livestock pasture (maintained)
- Residential lawn
- Roadway (Jacoby Road) to west of structures 4442 and 4443
- Roadway (Candlewood Hill Road) to west of structure 4444 and east of structure 4445
- Residences adjacent to structures 4443 and 4444

Water Resources

- Wetlands 15, 16, 17 and 18
- Wetland cover types – PEM, PEM/PSS, PEM/PSS/PFO
- Wetland 15 and 16 cover type = PEM
- Watercourses – Waterbody S4 (Candlewood Hill Brook), S5 and S6
- 100-year floodplain of Candlewood Hill Brook (Waterbody S4)

Wetland and Watercourse Crossings

- Wetlands 15 and 16 – temporary construction mats for work pad

Right-of-Way Vegetation

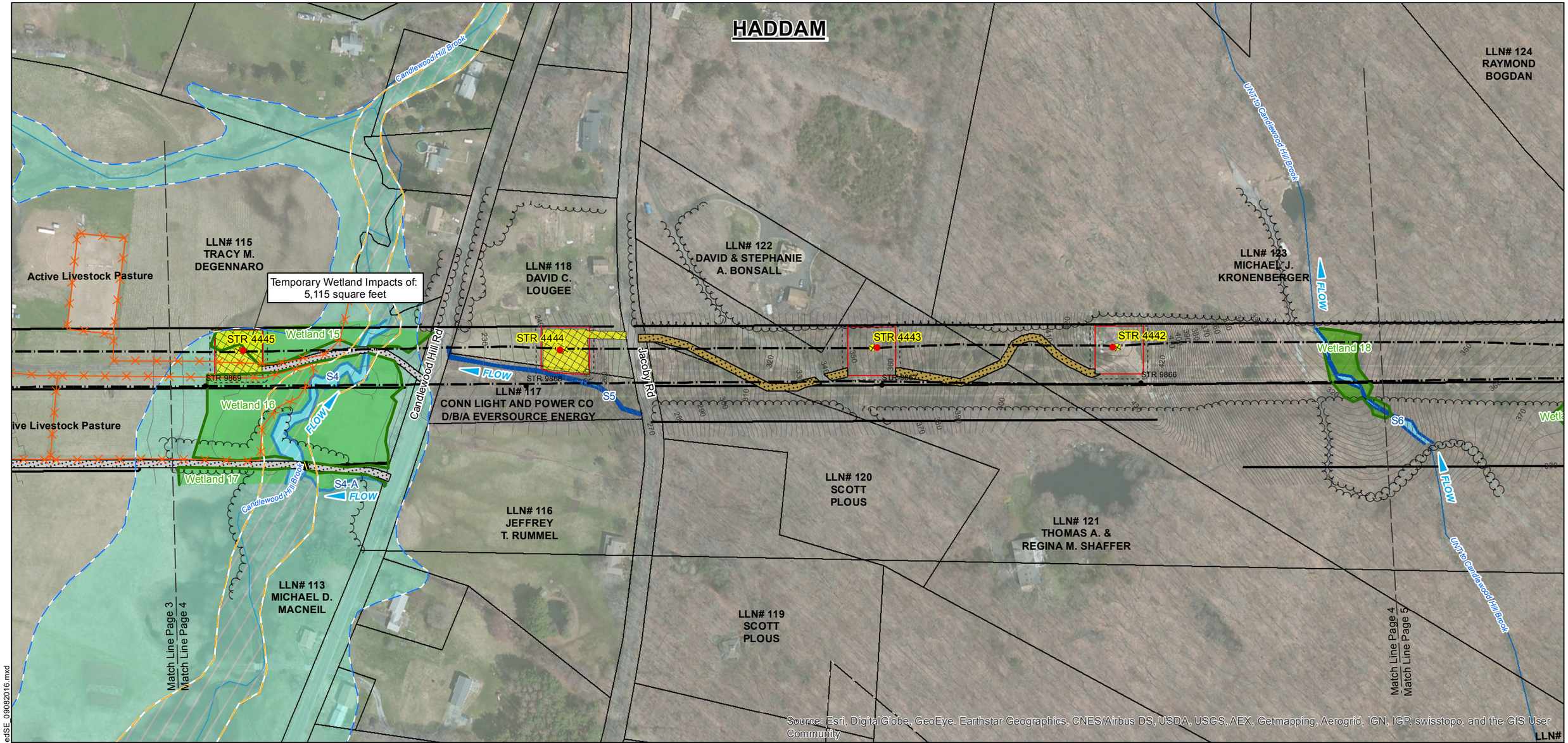
- Scrub-shrub, herbaceous, forested, livestock pasture (maintained)

Access

- Structure 4442 to 4444: from existing ROW access road off of Jacoby Road
- Structure 4445: from existing ROW access road off of Candlewood Hill Road

Existing Maintained Right-of-Way Width

- 200 feet



STR#	DESCRIPTION	HEIGHT (FT)	FINISH	FOUNDATION
4445	STEEL MONOPOLE	115	WEATHERING STEEL	DRILLED SHAFT
4444	STEEL MONOPOLE	125	WEATHERING STEEL	DRILLED SHAFT
4443	STEEL MONOPOLE	120	WEATHERING STEEL	DRILLED SHAFT
4442	STEEL MONOPOLE	100	WEATHERING STEEL	DRILLED SHAFT

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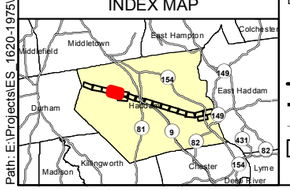

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- Temporary Matting
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- Approximate Existing Tree Line
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- Municipal Boundary
- Hiking Trails
- CT DEEP Property
- CT DEEP NDDB Area

1 inch = 200 feet
0 50 100 200 Feet

NO.	DATE	REVISIONS	BY	CHK	APP	APP

EVERSOURCE

1620/1975 Lines Structure Replacement Project

Haddam, CT

Map Sheet 4 of 17

9/21/2016

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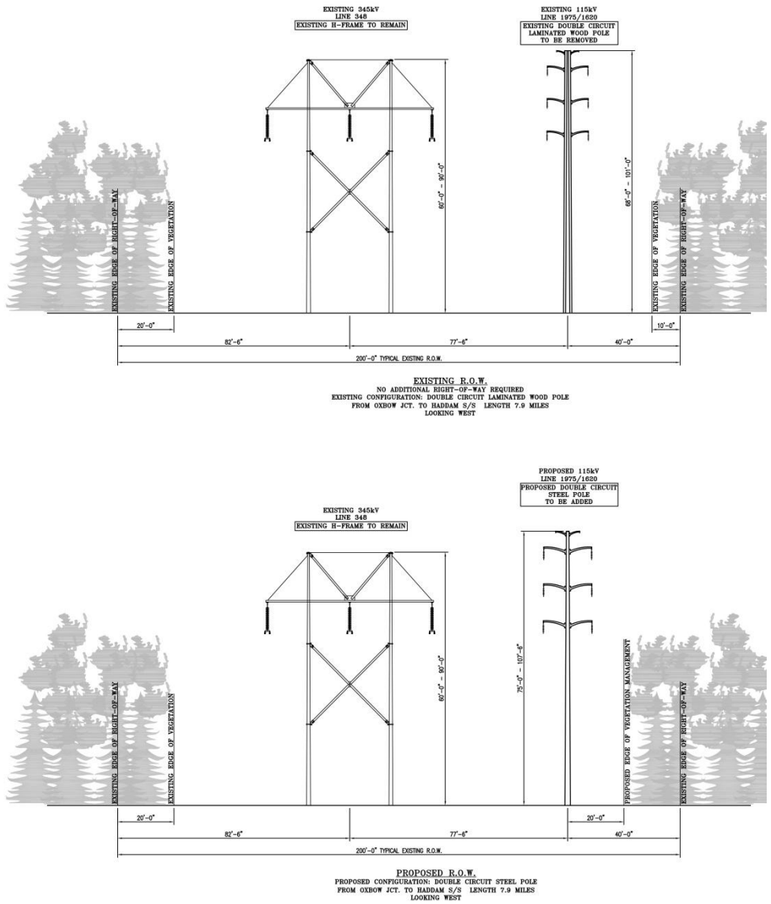
MAPSHEET 05 of 17
1620/1975 Lines Structure Replacement Project
Replacement Structures 4437 to 4441
Haddam, Connecticut



ABUTTERS TO PROJECT RIGHT-OF-WAY		
Line List No.	**Owner Name (Now or Formerly)**	**Property Address**
121	Thomas A & Regina Shaffer	27 Jacoby Road
123	Michael J Kronenberger	103 Nason Road
124	Raymond Bogdan	103 Nason Road
125	Nason Group LLC	Silverspring Drive
126	Jean Hanavan & Christopher J Kelley	350 Silverspring Drive
127	Joseph Reinhardt	16 Mill Run Lane
128	James J. & Pamela E. Johnson	16 Mill Run Lane
129	Muraleeddharan Gopinathan & Teresa Allen	19 Mill Run Lane
130	Nason Group LLC	Silverspring Drive
131	Jan J Van Arnam Sr.	152 Silverspring Drive
132	Tadeusz & Grazyna Jastrzebski	200 Silverspring Drive

AREA DESCRIPTION

Existing Adjacent Land Use

- Undeveloped, forested
- Menunketesuck-Cockaponset Regional Greenway – crosses ROW
- Residential
- Waterbody (Scovill Reservoir)

Road Crossings

- Mill Run Lane

RIGHT-OF-WAY DESCRIPTION

Right-of-Way Land Use

- Maintained electric transmission facilities corridor
- Undeveloped, forested
- Menunketesuck-Cockaponset Regional Greenway – crosses ROW
- Residential lawn
- Driveway
- Roadway (Mill Run Lane) to west of structure 4438 and east of structure 4439
- Residences adjacent to structure 4438 and 4439

Water Resources

- Wetlands 19, 20, 21, 22 and 23
- Wetland cover types – PFO, PSS, PSS/PFO
- Watercourses – Waterbody S6, S7, S8, S9, S10, S11

Wetland and Watercourse Crossings

- Watercourse S8 – temporary stream crossing BMPs for access road

Right-of-Way Vegetation

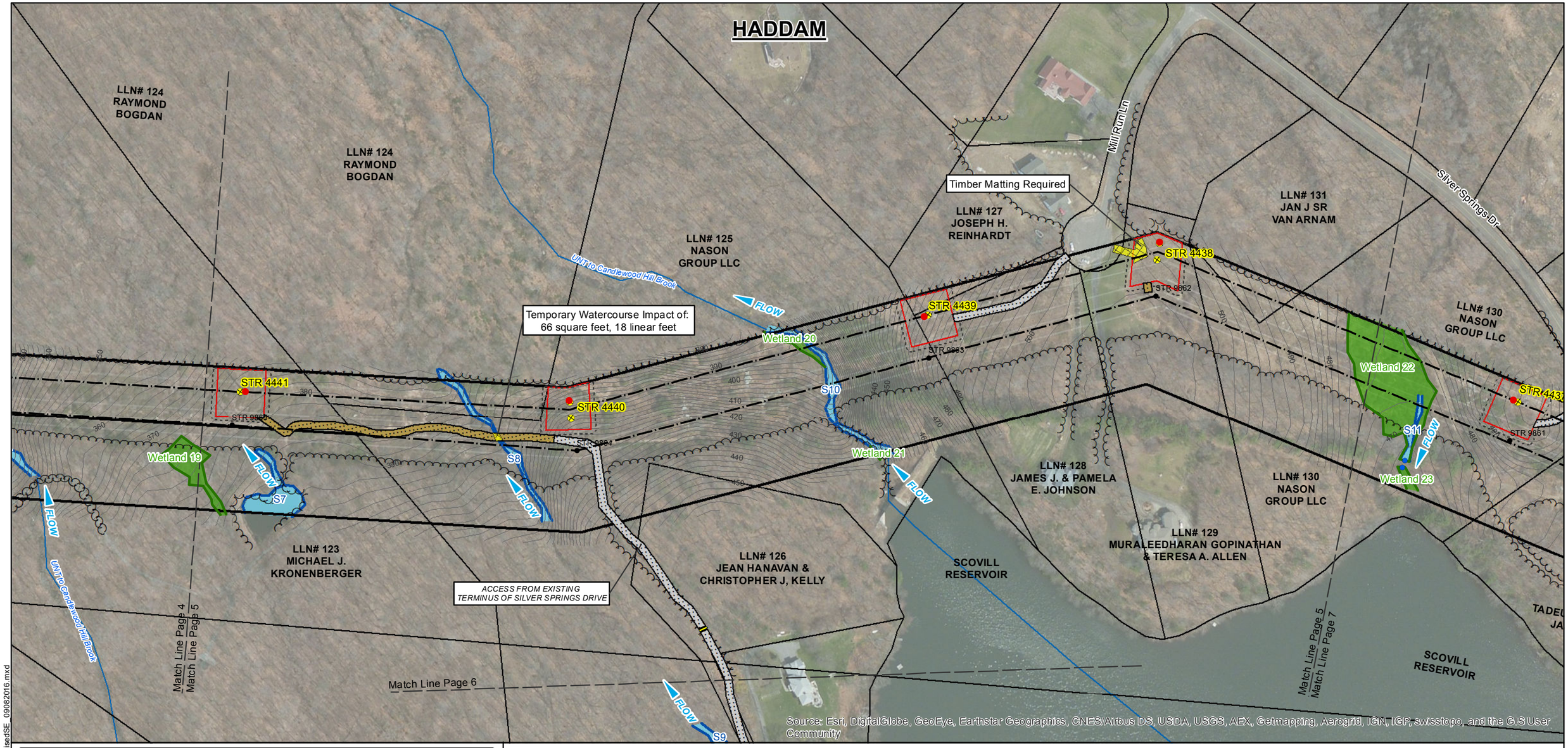
- Scrub-shrub
- Herbaceous
- Forested

Access

- Structure 4437: from existing off-ROW and ROW access road off of Silver Springs Drive
- Structures 4438 and 4439: from existing ROW access road off of Mill Run Lane
- Structure 4440 and 4441: off-ROW access from Silver Spring Drive

Existing Maintained Right-of-Way Width

- 200 feet



STR#	DESCRIPTION	HEIGHT (FT)	FINISH	FOUNDATION
4441	STEEL MONOPOLE	115	WEATHERING STEEL	DRILLED SHAFT
4440	STEEL H-FRAME (2 POLE)	95/100	WEATHERING STEEL	DRILLED SHAFT
4439	STEEL MONOPOLE	100	WEATHERING STEEL	DRILLED SHAFT
4438	STEEL H-FRAME (2 POLE)	105/105	WEATHERING STEEL	DRILLED SHAFT
4437	STEEL MONOPOLE	120	WEATHERING STEEL	DRILLED SHAFT

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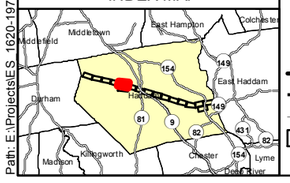

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- Hiking Trails
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- CT DEEP NDDB Area

1 inch = 200 feet
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NO.	DATE	REVISIONS	BY	CHK	APP	APP

EVERSOURCE

1620/1975 Lines Structure Replacement Project

Haddam, CT

Map Sheet 5 of 17

9/21/016

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MAPSHEET 06 of 17
1620/1975 Lines Structure Replacement Project
Access to Replacement Structures 4440 and 4441
Haddam, Connecticut

NO ROW CROSS SECTION – OFF-ROW ACCESS ONLY

AREA DESCRIPTION

Existing Adjacent Land Use

- Undeveloped, forested
- Menunketesuck-Cockaponset Regional Greenway – crosses ROW
- Residential

Road Crossings

- None

RIGHT-OF-WAY DESCRIPTION

Right-of-Way Land Use

- Not Applicable (off-ROW)

Water Resources

- Watercourse – Waterbody S9

Wetland and Watercourse Crossings

- None

Right-of-Way Vegetation

- Not Applicable (off-ROW)

Access

- Structures 4440 to 4441: existing off-ROW gravel access road off of Silver Spring Drive

Existing Maintained Right-of-Way Width

- Not Applicable (off-ROW)

ABUTTERS TO PROJECT RIGHT-OF-WAY		
Line List No.	**Owner Name (Now or Formerly)**	**Property Address**
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125	Nason Group LLC	Silverspring Drive
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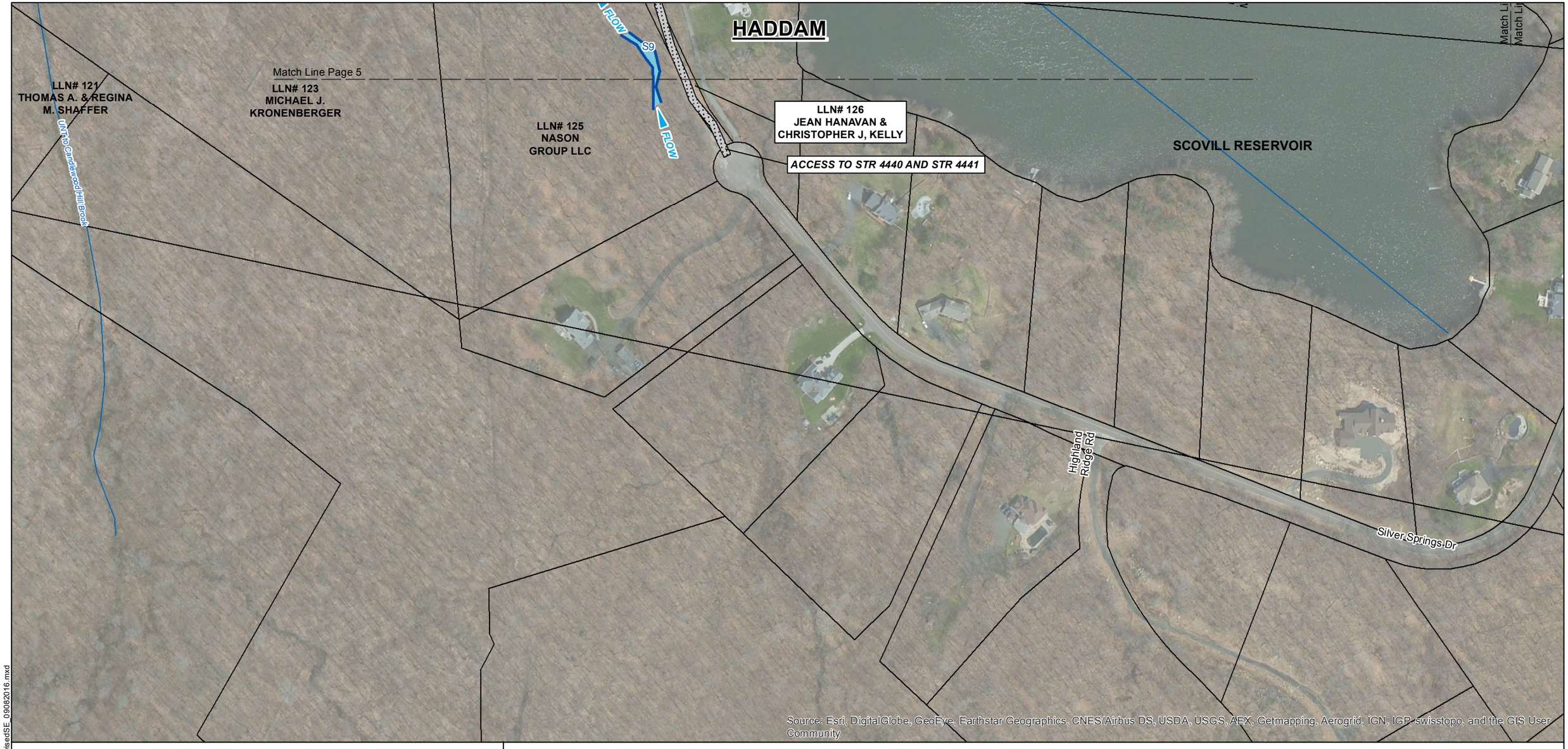
132	Tadeusz & Grazyna Jastrzebski	200 Silverspring Drive



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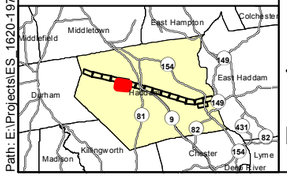

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1 inch = 200 feet
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1620/1975 Lines Structure Replacement Project

Haddam, CT

Map Sheet 6 of 17

9/21/2016

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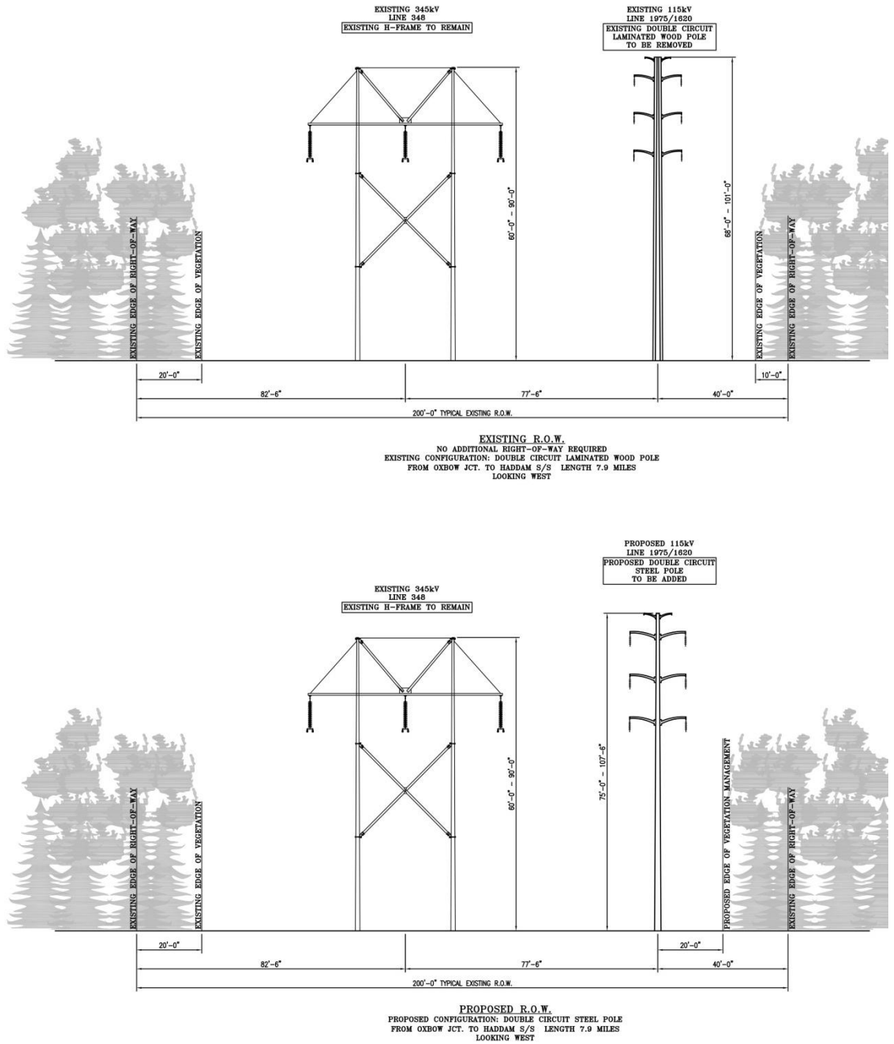
MAPSHEET 07 of 17
1620/1975 Lines Structure Replacement Project
Replacement Structures 4433 to 4437
Haddam, Connecticut



ABUTTERS TO PROJECT RIGHT-OF-WAY		
Line List No.	**Owner Name (Now or Formerly)**	**Property Address**
130	Nason Group LLC	Silverspring Drive
132	Tadeusz & Grazyna Jastrzebski	200 Silverspring Drive
133	Ernest R & Lisa Lemay	185 Silverspring Drive
134	Nason Group LLC	195 Silverspring Drive
135	Nason Group LLC	Silverspring Drive
136	Audrey J. Roberts	Skinner Road
137	Dish Mill Hill Associates LLC	Dish Mill Road

AREA DESCRIPTION

Existing Adjacent Land Use

- Undeveloped, forested
- Menunketesuck-Cockaponset Regional Greenway – crosses ROW

Road Crossings

- Silver Springs Drive

RIGHT-OF-WAY DESCRIPTION

Right-of-Way Land Use

- Maintained electric transmission facilities corridor
- Undeveloped, forested
- Menunketesuck-Cockaponset Regional Greenway – crosses ROW
- Roadway (Silver Springs Drive) to west of structure 4436 and east of structure 4437

Water Resources

- Wetlands 22, 23, 24, 25 and 26
- Wetland cover types – PSS/PFO, PFO, PEM, PSS
- Watercourses – Waterbody S11, S12, S13

Wetland and Watercourse Crossings

- Watercourse S12 – temporary stream crossing BMPs for access road and temporary matting for work pad
- Watercourse S13 – temporary stream crossing BMPs for access road

Right-of-Way Vegetation

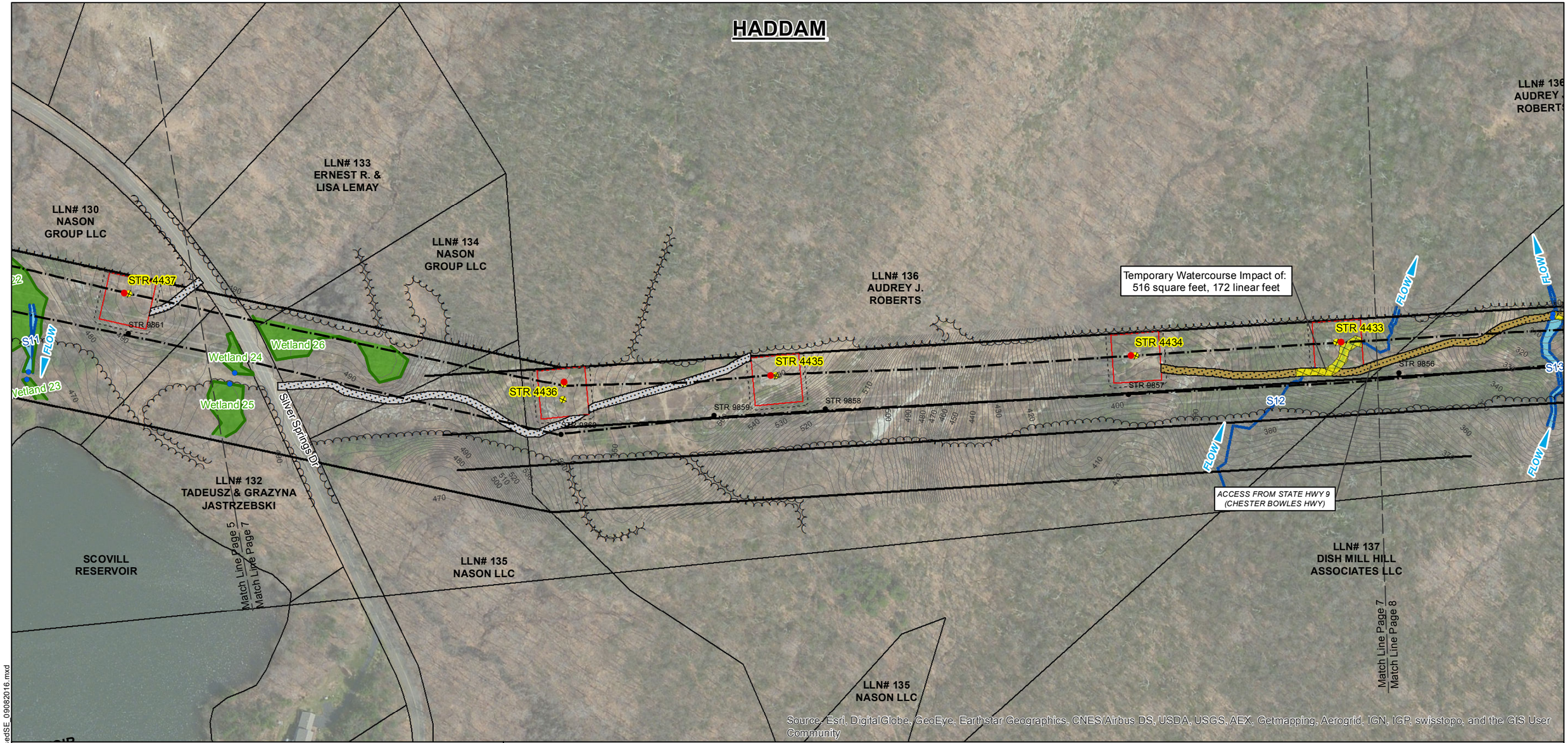
- Scrub-shrub
- Herbaceous
- Forested

Access

- Structures 4433 and 4434: from existing off-ROW and ROW access road off of State Highway 9
- Structure 4435 and 4436: from existing ROW access road off of Silver Springs Drive
- Structures 4437: from existing off-ROW and ROW access road off of Silver Spring Drive

Existing Maintained Right-of-Way Width

- 200 feet



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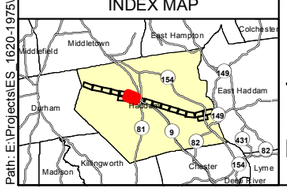

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- Water Area
- National Hydrography Dataset
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- Potential Vernal Pool (PVP)
- FEMA Floodway
- FEMA 100-Year Floodplain
- Construction Work Pad
- Temporary Matting
- Existing Improved Access Road
- Existing Unimproved Access Road
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- Approximate Limit of Disturbance
- MatchLines
- Municipal Boundary
- Hiking Trails
- CT DEEP Property
- CT DEEP NDDB Area

1 inch = 200 feet
0 50 100 200 Feet

NO.	DATE	REVISIONS	BY	CHK	APP	APP

EVERSOURCE

1620/1975 Lines Structure Replacement Project

Haddam, CT

Map Sheet 7 of 17

9/21/2016

AECOM

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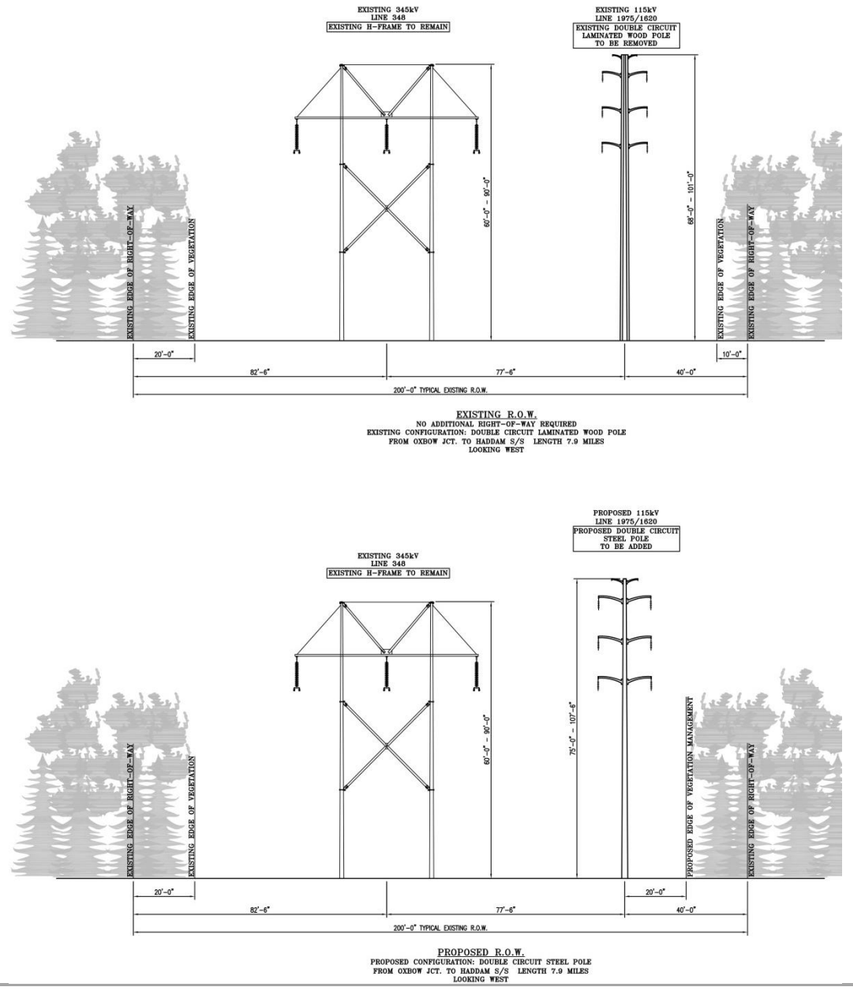
MAPSHEET 08 of 17
1620/1975 Lines Structure Replacement Project
Replacement Structures 4427 to 4432
Haddam, Connecticut



ABUTTERS TO PROJECT RIGHT-OF-WAY

Line List No.	Owner Name (Now or Formerly)	Property Address
136	Audrey J Roberts	Skinner Road
137	Dish Mill Associates, LLC	Dish Mill Road
138	Conn State of Municipal Division	State Highway Route 9
139	Joann M. Baroni Foristall	340 Killingworth Road
140	Joann M. Baroni Foristall	340 Killingworth Road
141	Joann M. Baroni Foristall	139 Morris Hubbard Road
142	Stephen J. & Karen A. Solosky	153 Morris Hubbard Road
143	Conn State of Municipal Division	17 Ranger Road

AREA DESCRIPTION

Existing Adjacent Land Use

- Undeveloped, forested
- Menunketesuck-Cockaponset Regional Greenway – crosses ROW
- State Highway 9
- Residential

Road Crossings

- Killingworth Road (State Highway 81)
- Chester Bowles Highway (State Highway 9)
- Morris Hubbard Road

RIGHT-OF-WAY DESCRIPTION

Right-of-Way Land Use

- Maintained electric transmission facilities corridor
- Menunketesuck-Cockaponset Regional Greenway – crosses ROW
- Residences adjacent to structure 4428
- Roadways (Morris Hubbard Road) to west of structure 4427, (Killingworth Road - State Highway 81) to the west of Structure 4429, and (Charles Bowles Highway - State Highway 9) between Structures 4429 and Structure 4430

Water Resources

- Wetland 27
- Wetland cover type - PSS
- Watercourses - Ponset Brook (not delineated; no proposed work activity in vicinity) and S13
- 100-year floodplain of Ponset Brook (no proposed work activity within this floodplain)

Wetland and Watercourse Crossings

- Waterbody S13 – temporary stream crossing BMPs for access road

Right-of-Way Vegetation

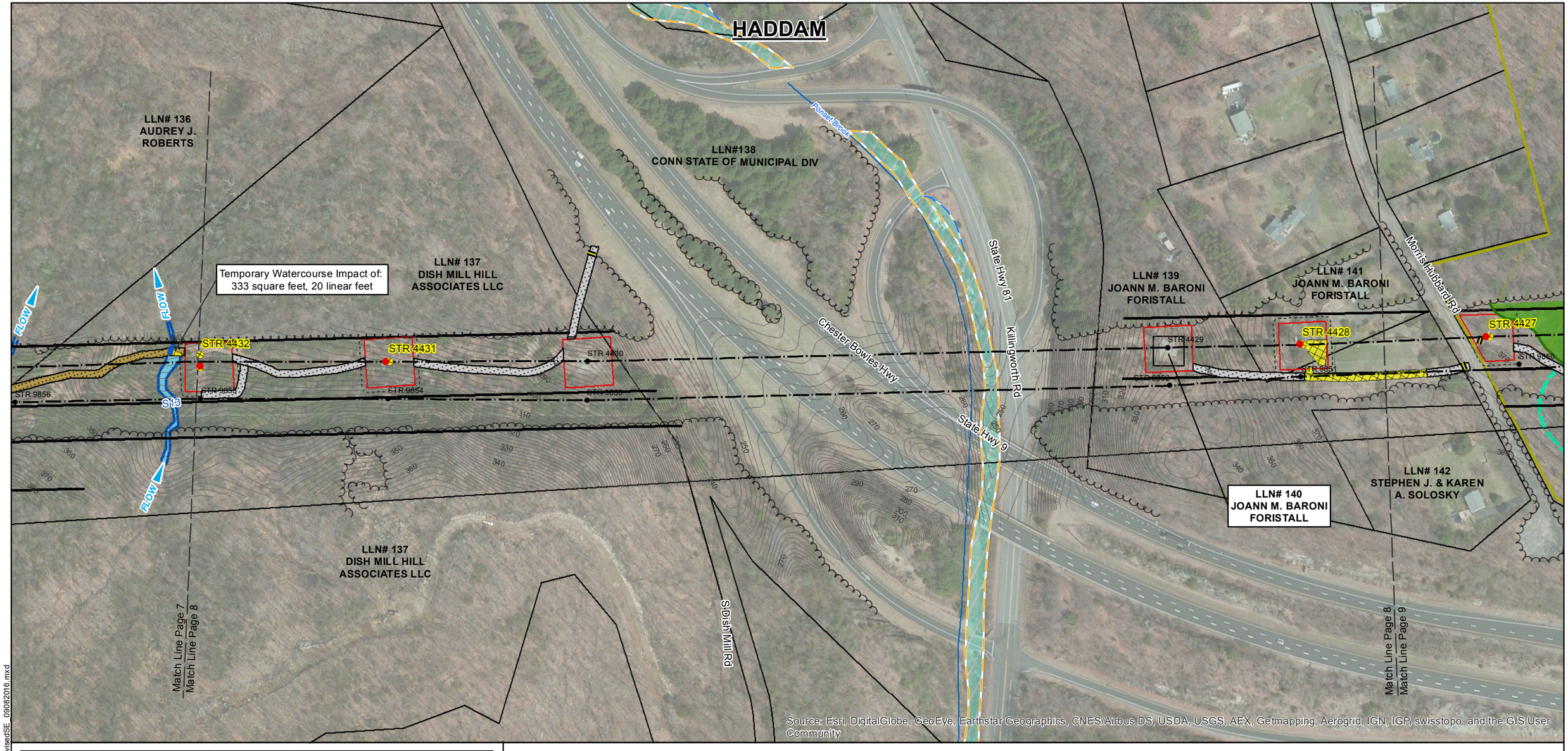
- Scrub-shrub
- Herbaceous
- Lawn grass

Access

- Structure 4427: from existing ROW access road off of Morris Hubbard Rd
- Structure 4428: from existing ROW access road off of Morris Hubbard Rd
- Structures 4431 and 4432: from existing off-ROW and ROW access road off of State Highway 9

Existing Maintained Right-of-Way Width

- 200 feet



STR#	DESCRIPTION	HEIGHT (FT)	FINISH	FOUNDATION
4432	STEEL H-FRAME (2 POLE)	95/100	WEATHERING STEEL	DRILLED SHAFT
4431	STEEL MONOPOLE	105	WEATHERING STEEL	DRILLED SHAFT
4430	NOT BEING REPLACED	N/A	N/A	N/A
4429	NOT BEING REPLACED	N/A	N/A	N/A
4428	STEEL MONOPOLE	120	WEATHERING STEEL	DRILLED SHAFT
4427	STEEL MONOPOLE	100	WEATHERING STEEL	DRILLED SHAFT

WORK AREA BOUNDARIES IN / NEAR WETLANDS:
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2. ALL PROJECT CONSTRUCTION ACTIVITIES WILL BE CONTAINED WITHIN THE DEPICTED APPROXIMATE LIMIT OF DISTURBANCE ASSOCIATED WITH WORK PADS AND ACCESS ROADSWORK AREA BOUNDARIES IN / NEAR WETLANDS

GENERAL NOTES
1. THE LIMITS OF DISTURBANCE AS SHOWN DEFINE AREAS WHERE VEGETATION REMOVAL AND GRUBBING, GRADING, AND EXCAVATION MAY OCCUR
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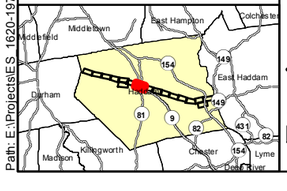
INDEX MAP



Legend
- Existing Structure to Remain
- Existing Structure to be Replaced
- Replacement Structure
- Existing Right-of-Way
- Transmission Line to Remain (Approx Centerline)
- 2' Contour Line
- Property Line
- Culvert
- Fence
- Gate
- Delineated Wetland
- Wetland Area
- Delineated Water
- Water Area
- National Hydrography Dataset
- Potential Vernal Pool (PVP) 100' Buffer
- Potential Vernal Pool (PVP)
- FEMA Floodway
- FEMA 100-Year Floodplain
- Construction Work Pad
- Temporary Matting
- Existing Improved Access Road
- Existing Unimproved Access Road
- Approximate Existing Tree Line
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- Hiking Trails
- CT DEEP Property
- CT DEEP NDDB Area

1 inch = 200 feet
0 50 100 200 Feet

NO.	DATE	REVISIONS	BY	CHK	APP	APP

EVERSOURCE

1620/1975 Lines Structure Replacement Project

Haddam, CT

Map Sheet 8 of 17

9/21/016

AECOM

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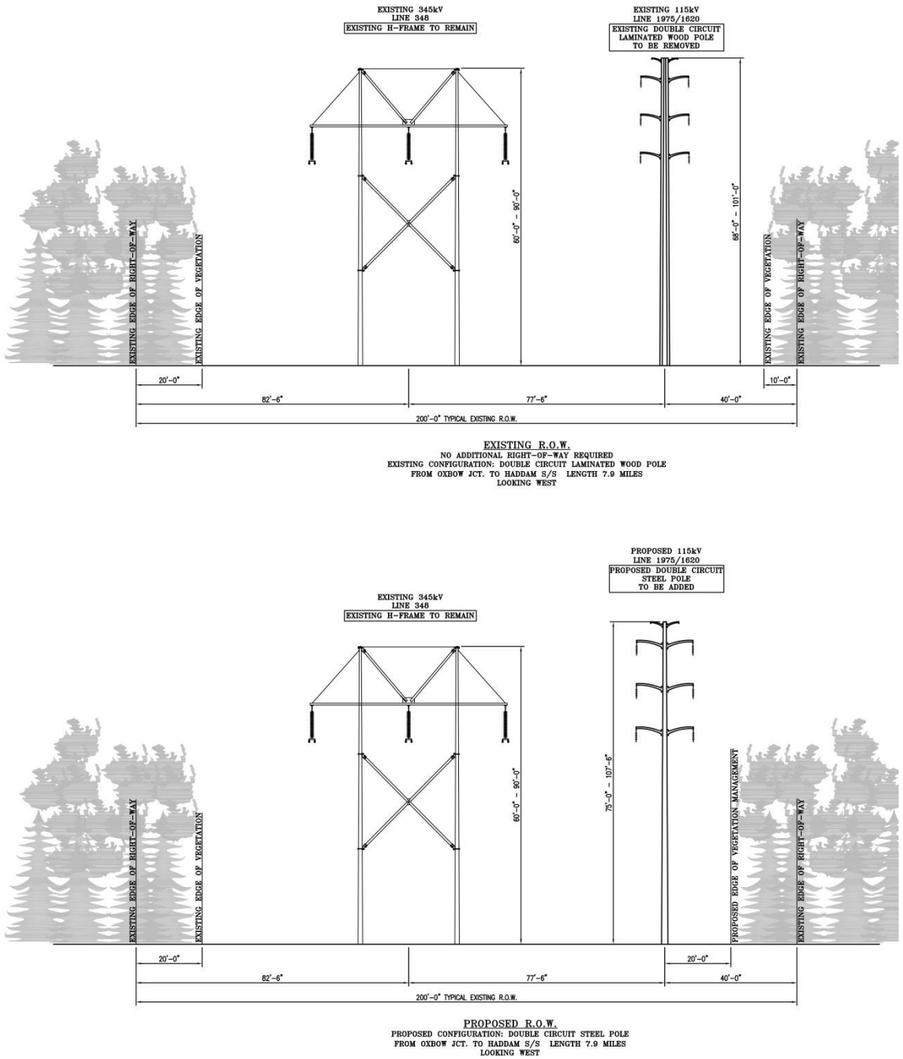
MAPSHEET 09 of 17
1620/1975 Lines Structure Replacement Project
Replacement Structures 4422 to 4427
Haddam, Connecticut



ABUTTERS TO PROJECT RIGHT-OF-WAY		
Line List No.	**Owner Name (Now or Formerly)**	**Property Address**
139	Joann M. Baroni Foristall	340 Killingworth Road
141	Joann M. Baroni Foristall	139 Morris Hubbard Road
142	Stephen J. & Karen A. Solosky	153 Morris Hubbard Road
143	Conn State of Municipal Division	17 Ranger Road
144	Haddam Land Trust, Inc	Hubbard Road

AREA DESCRIPTION

Existing Adjacent Land Use

- Residential
- Undeveloped, forested
- Menunketesuck-Cockaponset Regional Greenway – crosses ROW
- Recreational /open space (Haddam Land Trust and Cockaponset State Forest)
    - o Cockaponset Forest Trail
    - o Unnamed trails

Road Crossings

- Morris Hubbard Road

RIGHT-OF-WAY DESCRIPTION

Right-of-Way Land Use

- Maintained electric transmission facilities corridor
- Recreational / open space (Cockaponset State Forest and trails)
- Menunketesuck-Cockaponset Regional Greenway – crosses ROW
- Roadway (Morris Hubbard Road) to west of structure 4427

Water Resources

- Wetlands 27, 28, 29, 30, 31, 32 and 33
- Wetland cover types – PSS, PFO
- Wetlands 30 and 31 cover type = PSS
- Potential Vernal Pool 2 (associated with Wetland 28) and Potential Vernal Pool 3 (associated with Wetland 29)

Wetland and Watercourse Crossings

- Wetland 29 – temporary construction mats for access road
- Wetlands 30 and 31 – temporary construction mats for work pad at structure 4424

Right-of-Way Vegetation

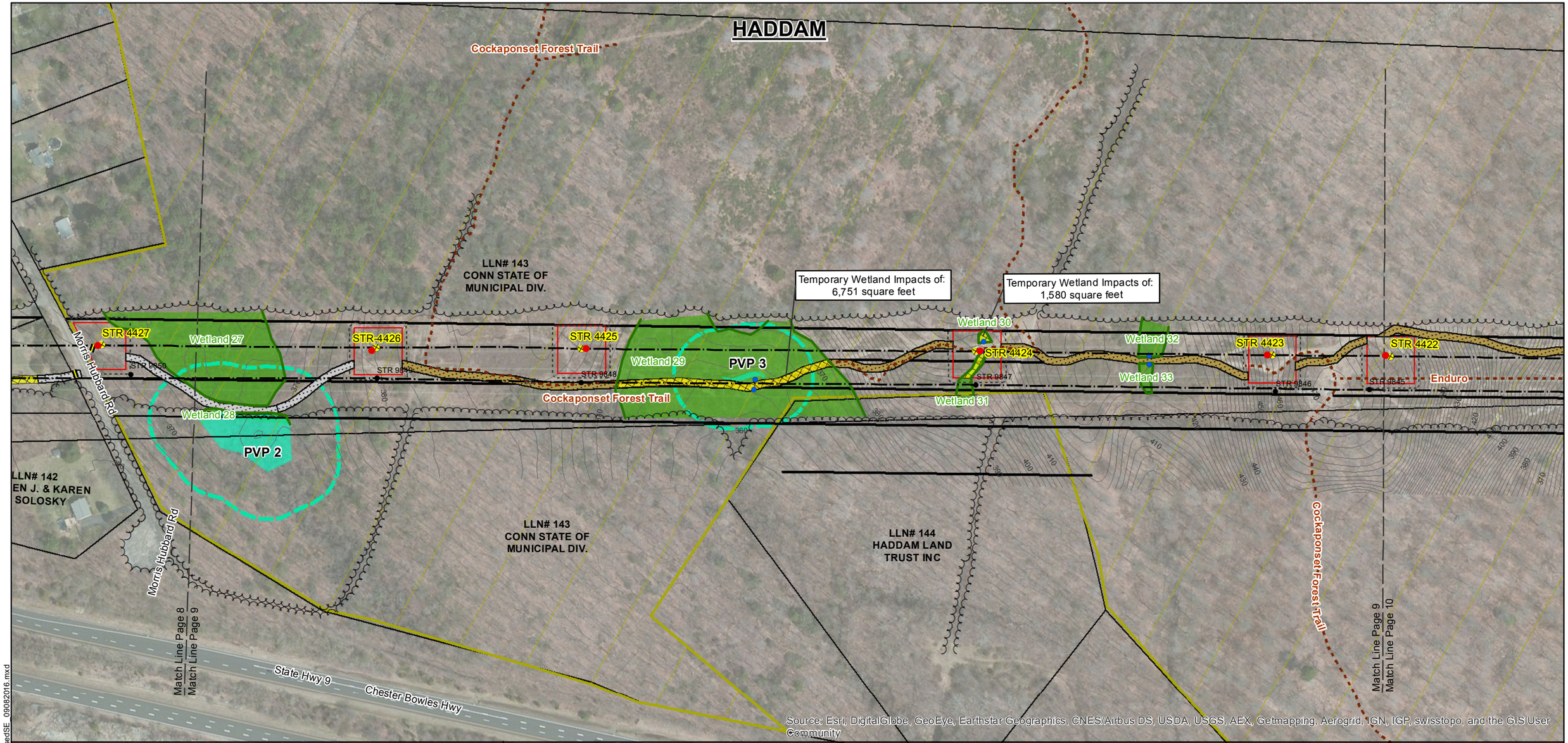
- Scrub-shrub
- Herbaceous
- Forested

Access

- Structures 4422 to 4427: from existing ROW access road off of Morris Hubbard Road

Existing Maintained Right-of-Way Width

- 200 feet



STR#	DESCRIPTION	HEIGHT (FT)	FINISH	FOUNDATION
4426	STEEL MONOPOLE	90	WEATHERING STEEL	DRILLED SHAFT
4425	STEEL MONOPOLE	100	WEATHERING STEEL	DRILLED SHAFT
4424	STEEL MONOPOLE	115	WEATHERING STEEL	DRILLED SHAFT
4423	STEEL MONOPOLE	100	WEATHERING STEEL	DRILLED SHAFT
4422	STEEL MONOPOLE	95	WEATHERING STEEL	DRILLED SHAFT

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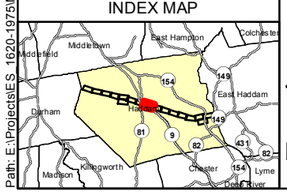
INDEX MAP



Legend
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- Existing Structure to be Replaced
- Replacement Structure
- Existing Right-of-Way
- Transmission Line to Remain (Approx Centerline)
- 2' Contour Line
- Property Line
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1 inch = 200 feet
0 50 100 200 Feet

NO.	DATE	REVISIONS	BY	CHK	APP	APP

EVERSOURCE

1620/1975 Lines Structure Replacement Project

Haddam, CT

Map Sheet 9 of 17

9/21/016

AECOM

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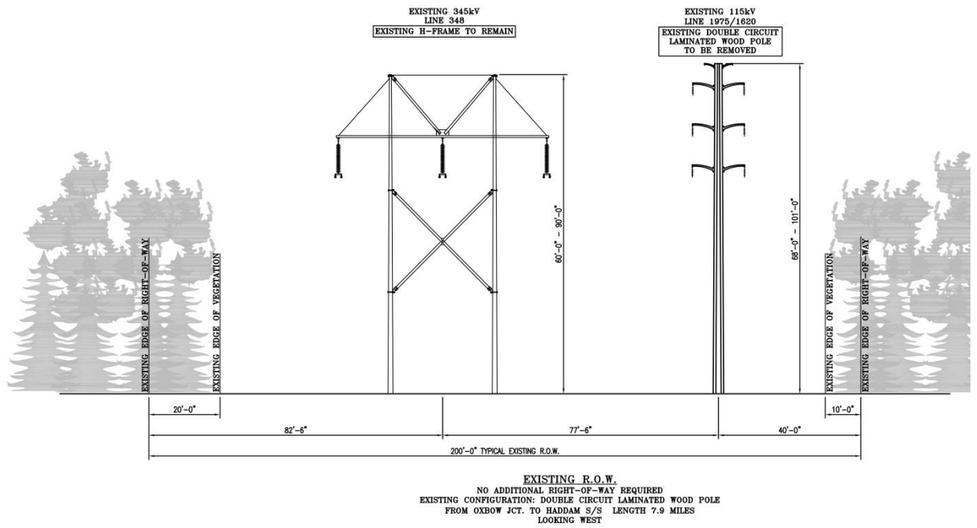
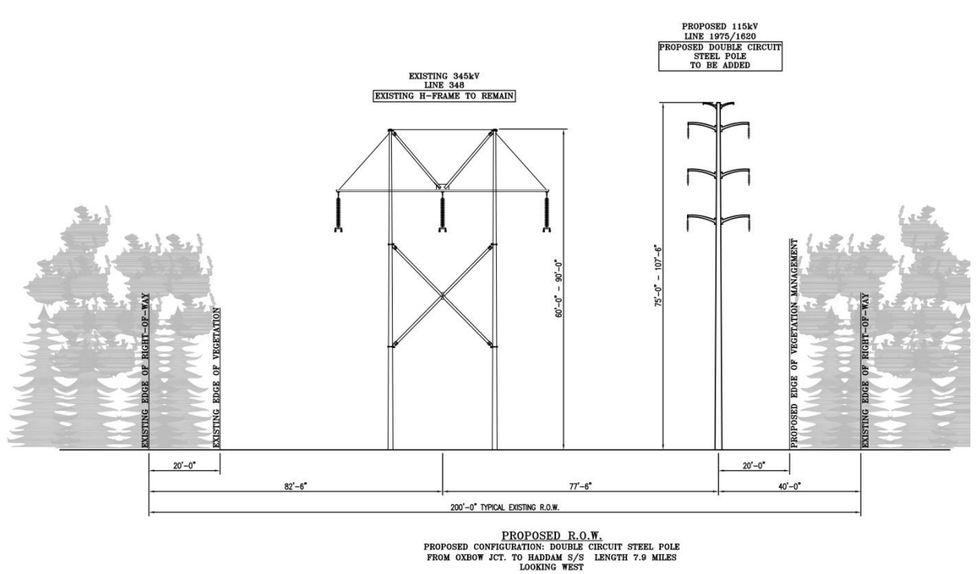
MAPSHEET 10 of 17
1620/1975 Lines Structure Replacement Project
Replacement Structures 4418 to 4421
Haddam, Connecticut



EXISTING R.O.W.
NO ADDITIONAL RIGHT-OF-WAY REQUIRED
EXISTING CONFIGURATION: DOUBLE CIRCUIT LAMINATED WOOD POLE
FROM OXBOW JCT. TO HADDAM S/S LENGTH 7.9 MILES
LOOKING WEST



PROPOSED R.O.W.
PROPOSED CONFIGURATION: DOUBLE CIRCUIT STEEL POLE
FROM OXBOW JCT. TO HADDAM S/S LENGTH 7.9 MILES
LOOKING WEST

ABUTTERS TO PROJECT RIGHT-OF-WAY		
Line List No.	**Owner Name (Now or Formerly)**	**Property Address**
143	Conn State of Municipal Division	17 Ranger Road

AREA DESCRIPTION

Existing Adjacent Land Use

- Undeveloped, forested
- Menunketesuck-Cockaponset Regional Greenway – crosses ROW
- Recreational / open space (Cockaponset State Forest)
  - Cockaponset Forest Trail
  - Enduro Trail
  - Unnamed trails

Road Crossings

- Old Ponsett Road (unimproved state forest road)

RIGHT-OF-WAY DESCRIPTION

Right-of-Way Land Use

- Maintained electric transmission facilities corridor
- Recreational / open space (Cockaponset State Forest)
- Menunketesuck-Cockaponset Regional Greenway – crosses ROW
- Roadway (Old Ponsett Road) to west of structure 4420

Water Resources

- Wetlands 34 and 35
- Wetland cover types – PSS, PSS/PFO
- Watercourses – Waterbody S14 and S15

Wetland and Watercourse Crossings

- Wetland 34 / Waterbody S14 – temporary construction mats and stream crossing BMPs for access road
- Wetland 35 / Waterbody S15 – temporary construction mats and stream crossing BMPs for access road

Right-of-Way Vegetation

- Scrub-shrub
- Herbaceous
- Forested

Access

- Structures 4418 to 4421: from existing ROW access road off of either Morris Hubbard Road and/or Beaver Meadow

Existing Maintained Right-of-Way Width

- 200 feet

HADDAM

UNT Pole Bridge Brook

Cockaponset Forest Trail

FLOW

Temporary Wetland Impacts of:
368 square feet
Temporary Watercourse Impacts of:
64 square feet, 16 linear feet

LLN# 143
CONN STATE OF
MUNICIPAL DIV.

Old Ponsett Rd

STR 4422

STR 4421

STR 9844

Wetland 34

Enduro

ACCESS FROM MORRIS HUBBARD ROAD

S14

STR 4420

STR 9843

STR 4419

STR 9842

STR 4418

STR 9841

S15

FLOW

UNT Pole Bridge Brook

Temporary Wetland Impact of:
742 square feet
Temporary Watercourse
Impact of:
54 square feet, 18 linear feet

Wetland 35

ACCESS FROM BEAVER MEADOW ROAD

FLOW

UNT Pole Bridge Brook

LLN# 143
CONN STATE OF
MUNICIPAL DIV.

Match Line Page 9
Match Line Page 10

Match Line Page 10
Match Line Page 11

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

STR#	DESCRIPTION	HEIGHT (FT)	FINISH	FOUNDATION
4421	STEEL MONOPOLE	100	WEATHERING STEEL	DRILLED SHAFT
4420	STEEL MONOPOLE	95	WEATHERING STEEL	DRILLED SHAFT
4419	STEEL MONOPOLE	100	WEATHERING STEEL	DRILLED SHAFT
4418	STEEL MONOPOLE	115	WEATHERING STEEL	DRILLED SHAFT

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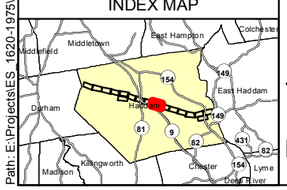
INDEX MAP



Legend

- Existing Structure to Remain
- Existing Structure to be Replaced
- Replacement Structure
- Existing Right-of-Way
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- Wetland Area
- Delineated Water
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- Potential Vernal Pool (PVP)
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- Temporary Matting
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1 inch = 200 feet
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EVERSOURCE

1620/1975 Lines Structure Replacement Project

Haddam, CT

Map Sheet 10 of 17

9/21/2016

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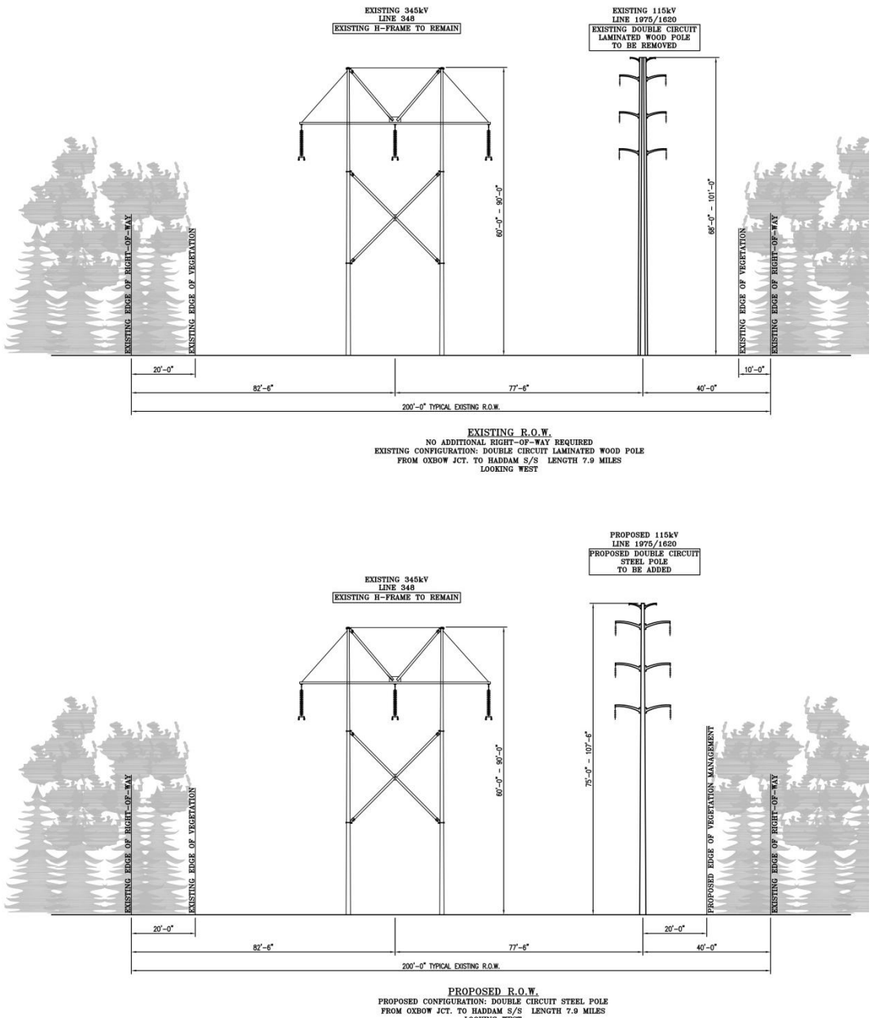
MAPSHEET 11 of 17
1620/1975 Lines Structure Replacement Project
Replacement Structures 4413 to 4417
Haddam, Connecticut



ABUTTERS TO PROJECT RIGHT-OF-WAY		
Line List No.	**Owner Name (Now or Formerly)**	**Property Address**
143	Conn State of Municipal Division	17 Ranger Road
145	Richard M. Eddinger	Beaver Meadow Road
146	Gilbert S. Madore	Ranger Road
147	Conn Light & Power Company d/b/a Eversouce Energy	Ranger Road
148	Richard M. Eddinger	Beaver Meadow Road

AREA DESCRIPTION

Existing Adjacent Land Use

- Undeveloped, forested
- Menunketesuck-Cockaponset Regional Greenway – crosses ROW
- Recreational / open space (Cockaponset State Forest)
    - Cockaponset Forest Trail / Quinimay Trail – crosses ROW

Road Crossings

- None

RIGHT-OF-WAY DESCRIPTION

Right-of-Way Land Use

- Maintained electric transmission facilities corridor
- Recreational / open space (Cockaponset State Forest and Trails)
- Cockaponset Forest Trail / Quinimay Trail – crosses ROW
- Menunketesuck-Cockaponset Regional Greenway – crosses ROW

Water Resources

- Wetlands – 35, 36 and 37
- Wetland cover types – PSS/PFO, PSS
- Wetland 36 cover type = PSS
- Watercourses – Waterbody S15 and S16

Wetland and Watercourse Crossings

- Wetland 35 / Waterbody S15 – temporary construction mats and stream crossing BMPs for access road
- Wetland 36 / Waterbody S16 – temporary construction mats and stream crossing BMPs for work pad at structure 4415

Right-of-Way Vegetation

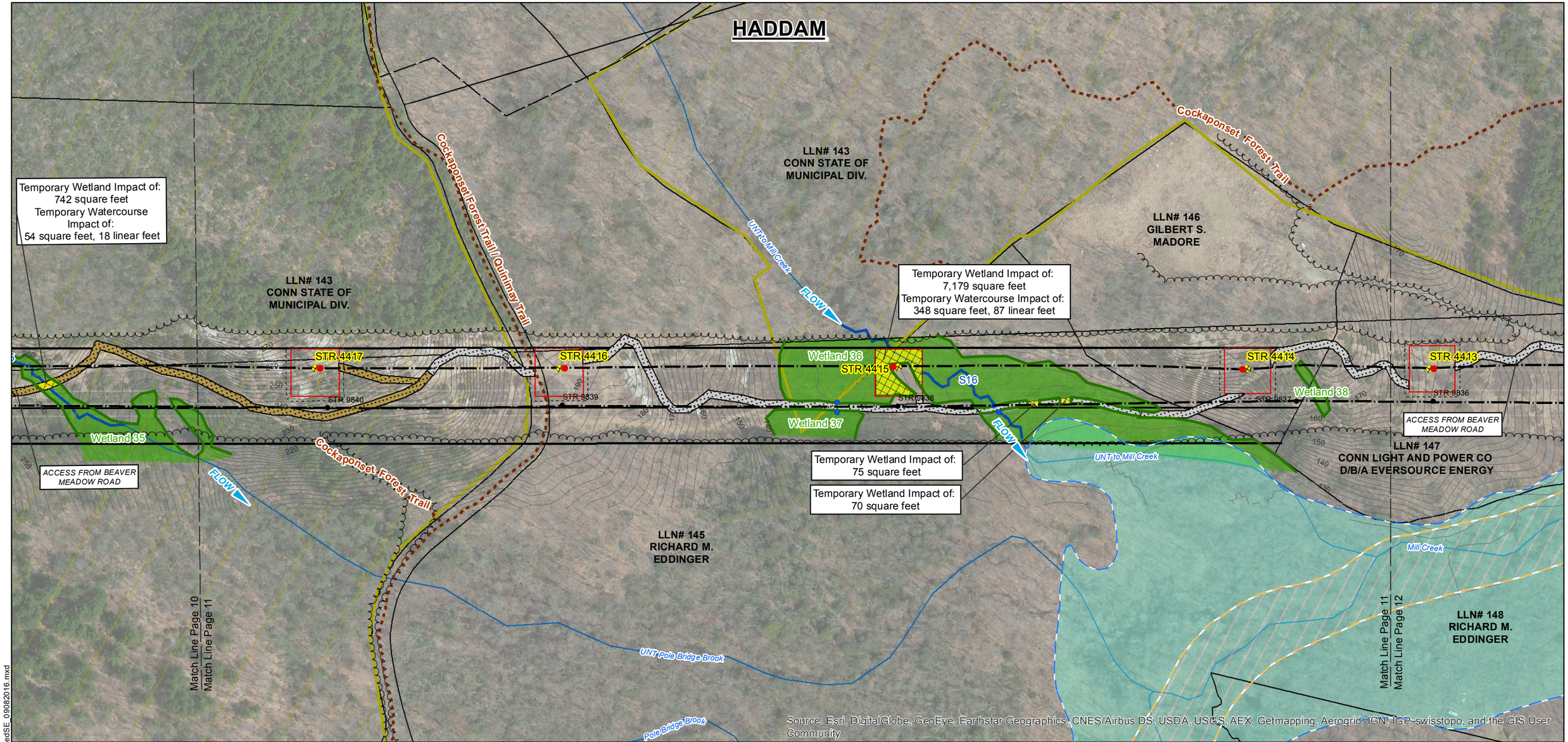
- Scrub-shrub
- Herbaceous
- Forested

Access

- Structures 4413 to 4417: from existing ROW access road off of Beaver Meadow Road

Existing Maintained Right-of-Way Width

- 200 feet



STR#	DESCRIPTION	HEIGHT (FT)	FINISH	FOUNDATION
4417	STEEL MONOPOLE	115	WEATHERING STEEL	DRILLED SHAFT
4416	STEEL MONOPOLE	110	WEATHERING STEEL	DRILLED SHAFT
4415	STEEL MONOPOLE	120	WEATHERING STEEL	DRILLED SHAFT
4414	STEEL MONOPOLE	110	WEATHERING STEEL	DRILLED SHAFT
4413	STEEL MONOPOLE	115	WEATHERING STEEL	DRILLED SHAFT

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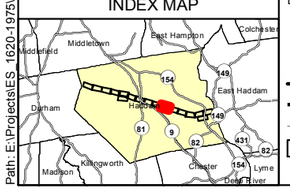

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- Hiking Trails
- CT DEEP Property
- CT DEEP NDDB Area

1 inch = 200 feet
0 50 100 200 Feet

NO.	DATE	REVISIONS	BY	CHK	APP	APP

EVERSOURCE

1620/1975 Lines Structure Replacement Project

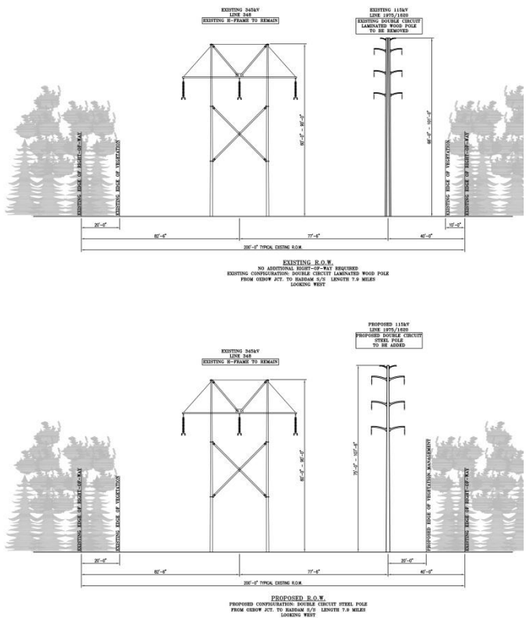
Haddam, CT

Map Sheet 11 of 17

9/21/2016

AECOM

MAPSHEET 12 of 17
1620/1975 Lines Structure Replacement Project
Replacement Structures 4410 to 4413
Haddam, Connecticut



ABUTTERS TO PROJECT RIGHT-OF-WAY		
Line List No.	**Owner Name (Now or Formerly)**	**Property Address**
143	Conn State of Municipal Division	17 Ranger Road
147	Conn Light & Power Company d/b/a Eversource Energy	Ranger Road
148	Richard M. Eddinger	Beaver Meadow Road
149	John P. & Patricia A. Colonghi	78 Beaver Meadow Road
150	Richard M. Eddinger	Beaver Meadow Road
151	Mary Ann Nelson	229 Hayden Hill Road
152	George W. Amarant	41 Beaver Meadow Road
153	George W. & Donna L. Amarant	Beaver Meadow Road
154	Christopher R. Burton & Jenna Snelgrove	43 Beaver Meadow Road
155	George W. & Donna L. Amarant	31 Beaver Meadow Road
156	Joelle Y. McKellar & Jerry G. Anku	55 Turkey Hill Road
157	Daniel A. Height	49 Turkey Hill Road
158	Conn Light & Power Company d/b/a Eversource Energy	Turkey Hill Road
159	Joseph A Jr. & Helen E. Deag	67 Turkey Hill Road
160	Conn Light & Power Company d/b/a Eversource Energy	Turkey Hill Road
161	Holly A. Blakely, Trustee	46 Turkey Hill Road
162	Jillian Kish	80 Turkey Hill Road
163	Dean Jones	Park Road
164	Richard J & Patricia Pytlik	Gulf Quarry Road

AREA DESCRIPTION

Existing Adjacent Land Use

- Undeveloped, forested
- Recreational / open space (Cockaponset State Forest)
- Menunketesuck-Cockaponset Regional Greenway – crosses ROW
- Residential

Road Crossings

- Bamforth Road
- Beaver Meadow Road
- Turkey Hill Road

RIGHT-OF-WAY DESCRIPTION

Right-of-Way Land Use

- Maintained electric transmission facilities corridor
- Recreational / open space (Cockaponset State Forest)
- Menunketesuck-Cockaponset Regional Greenway – crosses ROW
- Residences adjacent to structures 4410 and 4411
- Roadway (Bamforth Road) to the west of structure 4412, (Beaver Meadow Road) to the west of structure 4411 and (Turkey Hill Road) to the east of structure 4410
- Structures 4410 and 4411 work pads and access within CT DEEP NDDB Area

Water Resources

- Wetlands 39, 40, 41, 42 and 43
- Wetland cover types – PSS, PSS/PEM/PFO and PEM/PSS
- Wetland 39 cover type = PSS
- Watercourse - Waterbody S17 (Mill Creek), S18 and S19 (Turkey Hill Brook)
- Potential Vernal Pool 4 (associated with Wetland 41)
- 100-year floodplain of Mill Creek (Waterbody S17) and Turkey Hill Brook (Waterbody S19)

Wetland and Watercourse Crossings

- Wetland 39 – temporary construction mats for work pad at structure 4412

Right-of-Way Vegetation

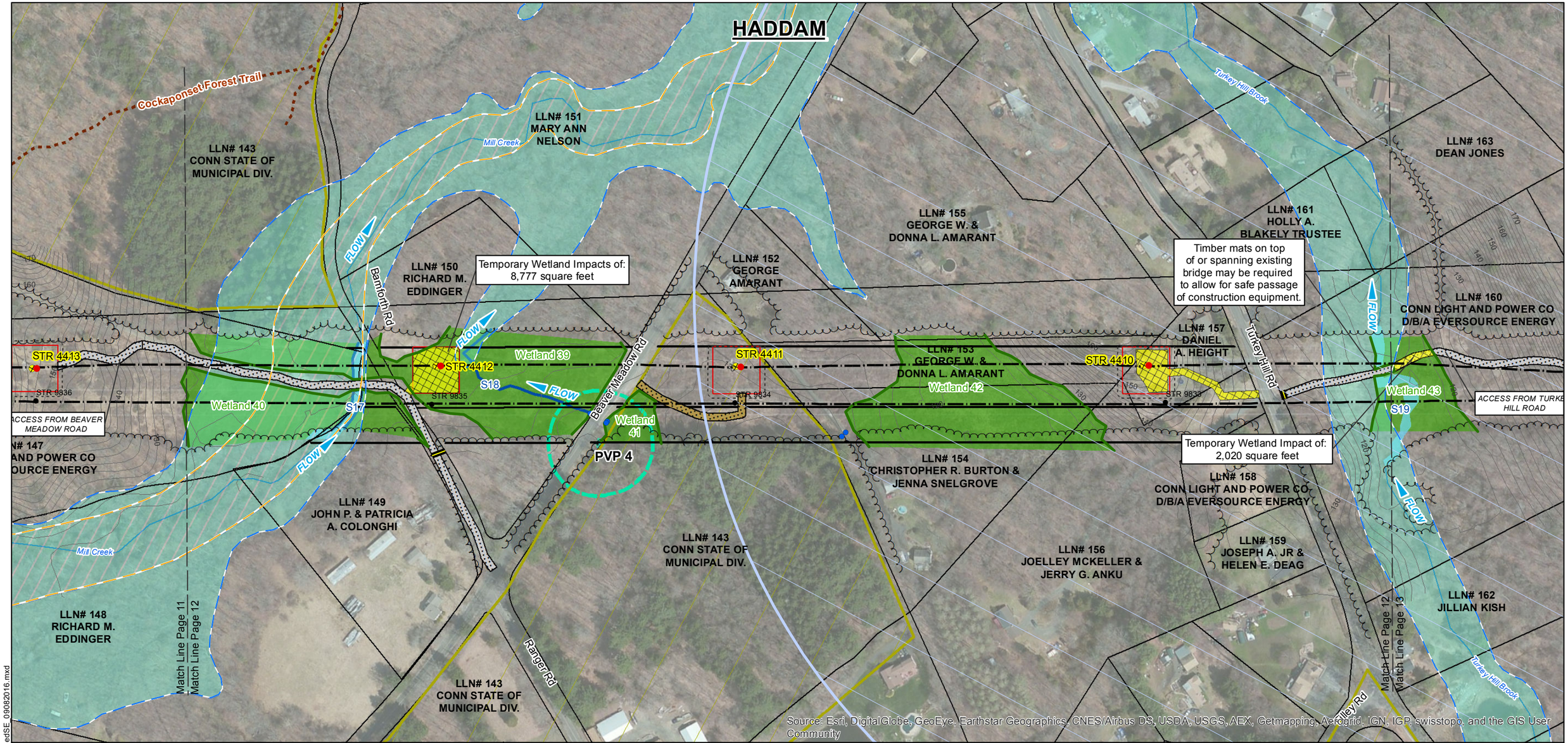
- Scrub-shrub, herbaceous, forested, lawn grass

Access

- Structure 4410: from existing ROW access road off of Turkey Hill Road
- Structure 4411: from existing ROW access road off of Beaver Meadow Road
- Structures 4412 and 4413: from existing ROW access road off of Bamford Road and Beaver Meadow Road

Existing Maintained Right-of-Way Width

- 200 feet



STR#	DESCRIPTION	HEIGHT (FT)	FINISH	FOUNDATION
4412	STEEL MONOPOLE	110	WEATHERING STEEL	DRILLED SHAFT
4411	STEEL MONOPOLE	120	WEATHERING STEEL	DRILLED SHAFT
4410	STEEL MONOPOLE	115	WEATHERING STEEL	DRILLED SHAFT

WORK AREA BOUNDARIES IN / NEAR WETLANDS:
1. VEGETATION REMOVAL WILL OCCUR WITHIN THE EXISTING RIGHT-OF-WAY LIMITS AS SHOWN. ADDITIONALLY, DANGER OR HAZARD TREE REMOVAL MAY BE REQUIRED OUTSIDE OF THE VEGETATION REMOVAL LIMITS.
2. ALL PROJECT CONSTRUCTION ACTIVITIES WILL BE CONTAINED WITHIN THE DEPICTED APPROXIMATE LIMIT OF DISTURBANCE ASSOCIATED WITH WORK PADS AND ACCESS ROADSWORK AREA BOUNDARIES IN / NEAR WETLANDS

GENERAL NOTES
1. THE LIMITS OF DISTURBANCE AS SHOWN DEFINE AREAS WHERE VEGETATION REMOVAL AND GRUBBING, GRADING, AND EXCAVATION MAY OCCUR
2. ALL WORK WILL BE CONDUCTED IN ACCORDANCE WITH THE RELEVANT PORTIONS OF EVERSOURCE'S BMP MANUAL: CONNECTICUT CONSTRUCTION AND MAINTENANCE ENVIRONMENTAL REQUIREMENTS (BMP MANUAL), UNLESS MORE STRINGENT PROJECT-SPECIFIC MEASURES APPLY.
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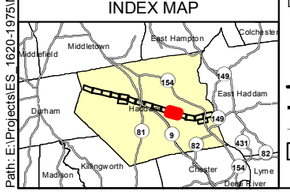
INDEX MAP



Legend

- Existing Structure to Remain
- Existing Structure to be Replaced
- Replacement Structure
- Existing Right-of-Way
- Transmission Line to Remain (Approx Centerline)
- 2' Contour Line
- Property Line
- Culvert
- Fence
- Gate
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- Wetland Area
- Delineated Water
- Water Area
- National Hydrography Dataset
- Potential Vernal Pool (PVP) 100' Buffer
- Potential Vernal Pool (PVP)
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- FEMA 100-Year Floodplain
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- CT DEEP NDDB Area

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0 50 100 200 Feet

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EVERSOURCE

1620/1975 Lines Structure Replacement Project

Haddam, CT

Map Sheet 12 of 17

9/21/2016

AECOM

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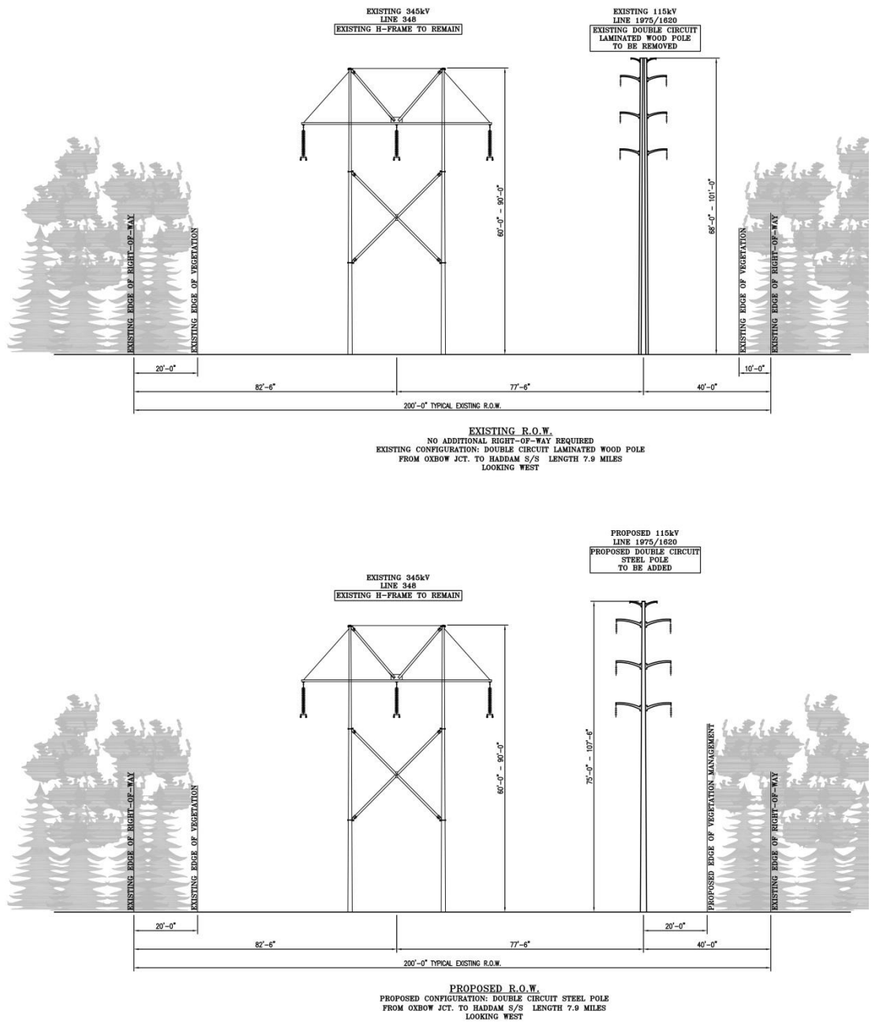
MAPSHEET 13 of 17
1620/1975 Lines Structure Replacement Project
Replacement Structures 4405 to 4409
Haddam, Connecticut



ABUTTERS TO PROJECT RIGHT-OF-WAY		
Line List No.	**Owner Name (Now or Formerly)**	**Property Address**
160	Connecticut Light & Power d/b/a Eversource Energy	Oxbow Road
162	Jillian Kish	80 Turkey Hill Road
163	Dean Jones	Park Road
164	Richard J. & Patricia S. Pytlik	Gulf Quarry Road
165	Matthew Pytlik	Turkey Hill Road
166	Charles R Sr + Helen R Steinhilper	Plains Road

AREA DESCRIPTION

Existing Adjacent Land Use

- Undeveloped, forested
- Menunketesuck-Cockaponset Regional Greenway – crosses ROW

Road Crossings

- None

RIGHT-OF-WAY DESCRIPTION

Right-of-Way Land Use

- Maintained electric transmission facilities corridor
- Menunketesuck-Cockaponset Regional Greenway – crosses ROW
- Structure 4409 work pad and access within CT DEEP NDDB Area

Water Resources

- Wetlands 43, 44, 45, and 46
- Wetland cover types – PEM/PSS, PSS

Wetland and Watercourse Crossings

- None

Right-of-Way Vegetation

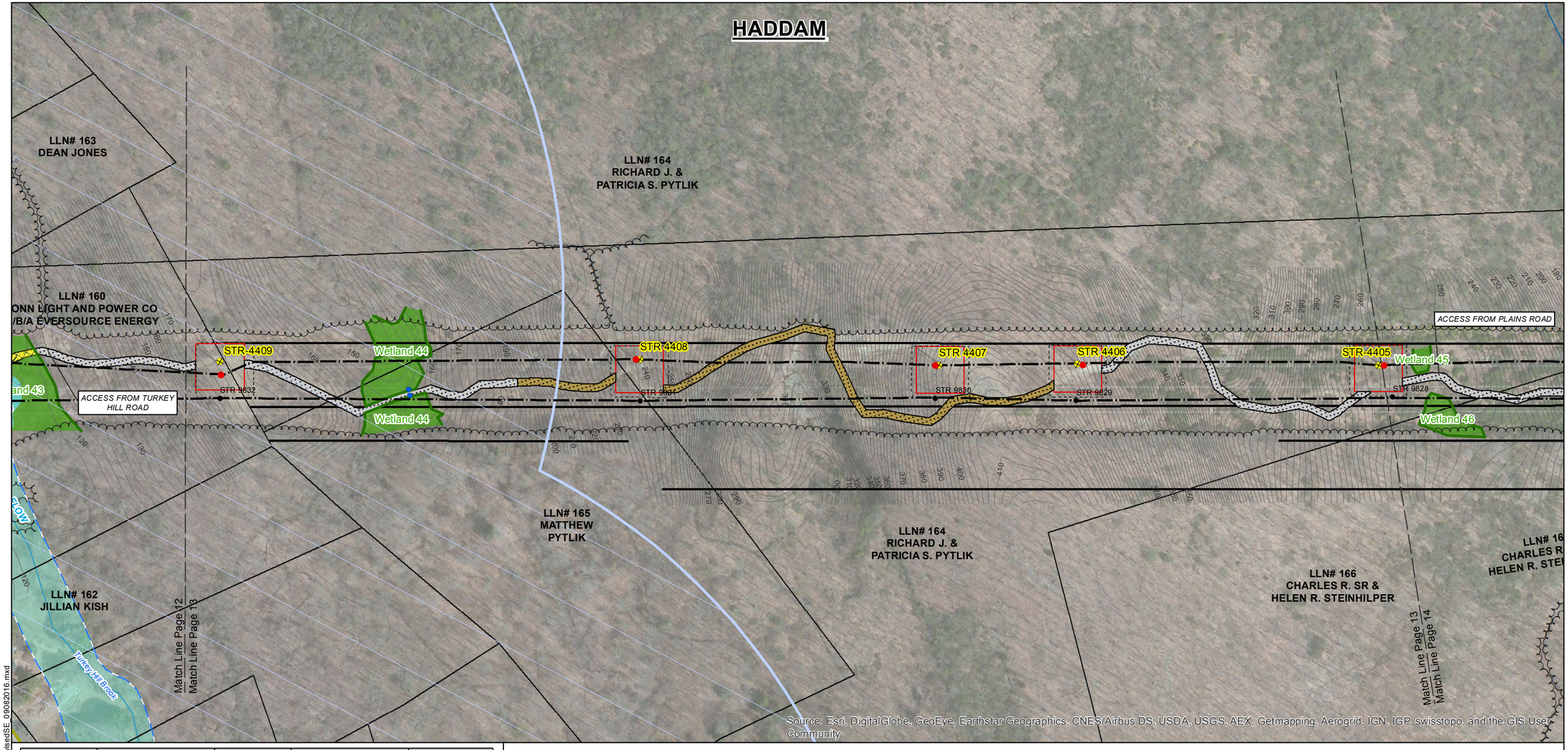
- Scrub-shrub
- Herbaceous
- Forested

Access

- Structures 4405 to 4409: from existing ROW access road off of Plains Road from the east and existing ROW access road from Turkey Hill Road from the west.

Existing Maintained Right-of-Way Width

- 200 feet



STR#	DESCRIPTION	HEIGHT (FT)	FINISH	FOUNDATION
4409	STEEL MONOPOLE	100	WEATHERING STEEL	DRILLED SHAFT
4408	STEEL MONOPOLE	120	WEATHERING STEEL	DRILLED SHAFT
4407	STEEL MONOPOLE	95	WEATHERING STEEL	DRILLED SHAFT
4406	STEEL MONOPOLE	110	WEATHERING STEEL	DRILLED SHAFT
4405	STEEL MONOPOLE	125	WEATHERING STEEL	DRILLED SHAFT

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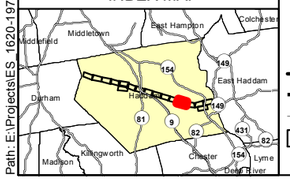

Legend
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1 inch = 200 feet
0 50 100 200 Feet

NO.	DATE	REVISIONS	BY	CHK	APP	APP

EVERSOURCE

1620/1975 Lines Structure Replacement Project

Haddam, CT

Map Sheet 13 of 17

9/21/2016

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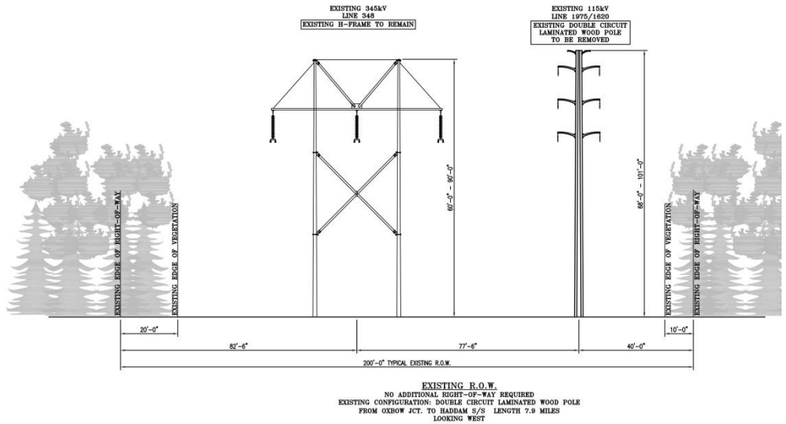
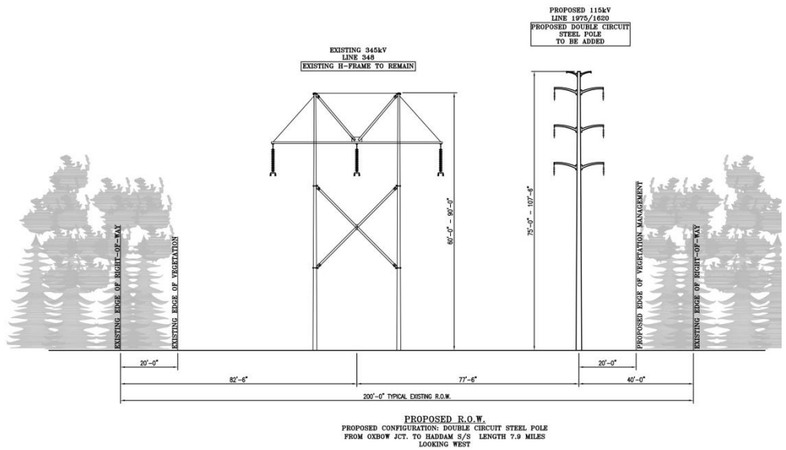
MAPSHEET 14 of 17
1620/1975 Lines Structure Replacement Project
Replacement Structures 4400 to 4404
Haddam, Connecticut



EXISTING R.O.W.
NO ADDITIONAL RIGHT-OF-WAY REQUIRED
EXISTING CONFIGURATION: DOUBLE CIRCUIT LAMINATED WOOD POLE
FROM OXBOW JCT. TO HADDAM S/S LENGTH 7.9 MILES
LOOKING WEST



PROPOSED R.O.W.
PROPOSED CONFIGURATION: DOUBLE CIRCUIT STEEL POLE
FROM OXBOW JCT. TO HADDAM S/S LENGTH 7.9 MILES
LOOKING WEST

ABUTTERS TO PROJECT RIGHT-OF-WAY		
Line List No.	**Owner Name (Now or Formerly)**	**Property Address**
164	Richard J & Patricia S Pytlik	Gulf Quarry Road
166	Charles R Sr + Helen R Steinhilper	Plains Road
167	Conn State of Municipal Division	Plains Road
168	Conn State of Municipal Division	Plains Road
169	Rosemary Vinci	Plains Road
170	Shawn E & Kathy L Monroe	171 Plains Road
171	Conn State of Municipal Division	Plains Road
172	Thomas J & Robin M Maule	180 Plains Road
173	Connecticut Light & Power d/b/a Eversource Energy	Plains Road
174	Anachristina Minerly	200 Plains Road

AREA DESCRIPTION

Existing Adjacent Land Use

- Undeveloped, forested
- Recreational / open space (Cockaponset State Forest)
- Menunketesuck-Cockaponset Regional Greenway – crosses ROW
- Residential

Road Crossings

- Plains Road

RIGHT-OF-WAY DESCRIPTION

Right-of-Way Land Use

- Maintained electric transmission facilities corridor
- Recreational / open space (Cockaponset State Forest)
- Menunketesuck-Cockaponset Regional Greenway – crosses ROW
- Roadway (Plains Road) to west of structures 4401 and 4402 and east of structures 4403 and 4404

Water Resources

- Wetlands 45, 46, 47, 48, 49, 50, 51, 52, 53
- Wetland cover types – PSS, PSS/PEM
- Watercourses – Waterbody S20, S21, S22, S23, S24
- Potential Vernal Pool 5 (associated with Wetland 53)

Wetland and Watercourse Crossings

- None

Right-of-Way Vegetation

- Scrub-shrub
- Herbaceous
- Forested

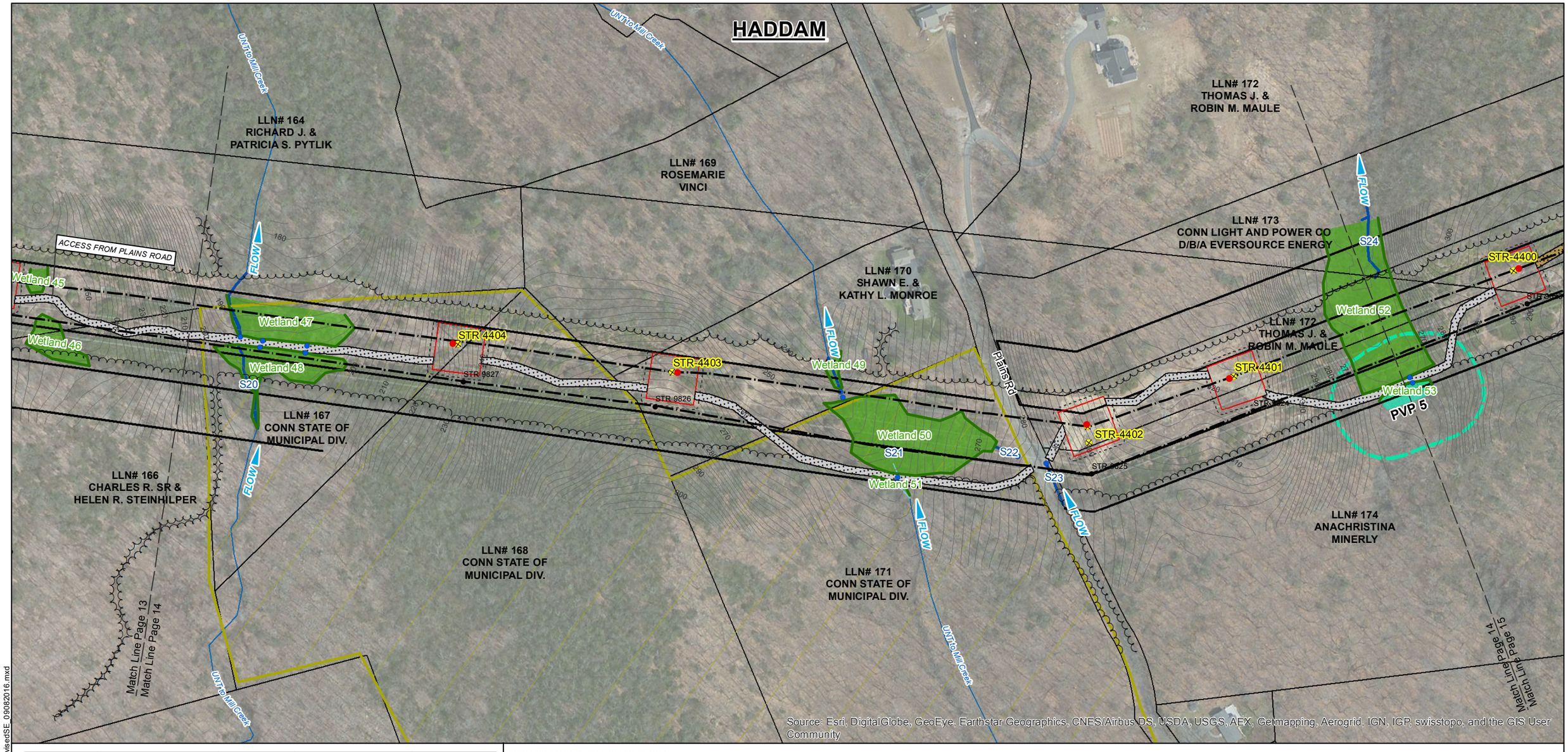
Access

- Structures 4400 through 4404: from existing access road off of Plains Road

Existing Maintained Right-of-Way Width

- 200 feet

HADDAM



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

STR#	DESCRIPTION	HEIGHT (FT)	FINISH	FOUNDATION
4404	STEEL MONOPOLE	120	WEATHERING STEEL	DRILLED SHAFT
4403	STEEL MONOPOLE	100	WEATHERING STEEL	DRILLED SHAFT
4402	STEEL H-FRAME (2 POLE)	100/100	WEATHERING STEEL	DRILLED SHAFT
4401	STEEL MONOPOLE	90	WEATHERING STEEL	DRILLED SHAFT

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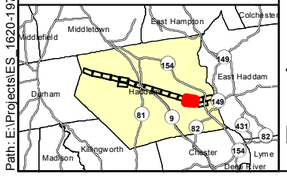
INDEX MAP



Legend
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NO.	DATE	REVISIONS	BY	CHK	APP	APP

EVERSOURCE

1620/1975 Lines Structure Replacement Project

Haddam, CT

Map Sheet 14 of 17

9/21/2016

AECOM

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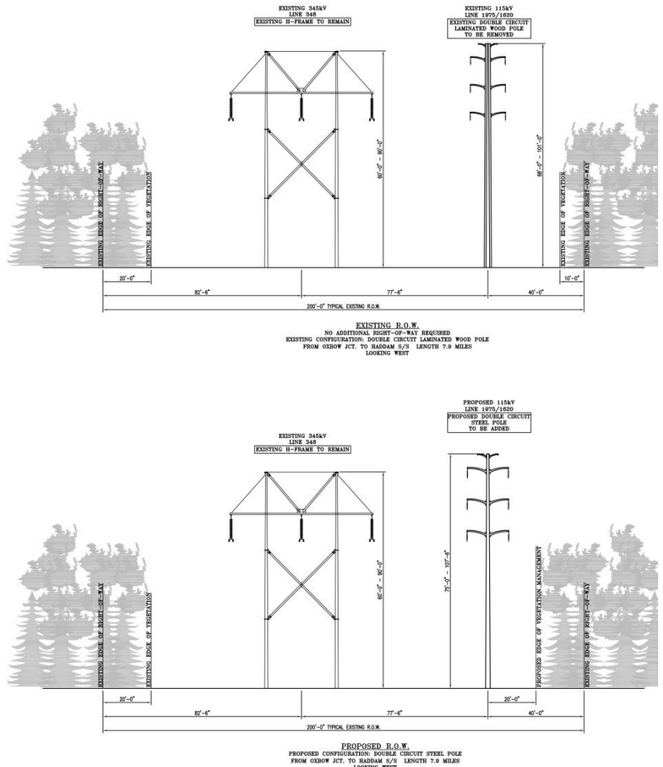
MAPSHEET 15 of 17
1620/1975 Lines Structure Replacement Project
Replacement Structures 4395 to 4400
Haddam, Connecticut



ABUTTERS TO PROJECT RIGHT-OF-WAY		
Line List No.	**Owner Name (Now or Formerly)**	**Property Address**
172	Thomas J & Robin M Maule	180 Plains Road
173	Connecticut Light & Power d/b/a Eversource Energy	Plains Road
174	Anachristina Minerly	200 Plains Road
175	Thomas J & Robin M Maule	Plains Road
176	Robert A Chiulli	Plains Road
177	Chumley LLC	Saybrook Road
178	Michael & Rebecca K McDonnell	Old Cart Road
179	Michael McDonnell	Old Cart Road
180	Lloyd & Diane T Bowden	148 Old Cart Road
181	Donald A & Marianne C Smith	42 Smith Hill Road
182	Donald A & Marianne C Smith	Saybrook Road
183	Marianne C Smith	Saybrook Road
184	Eugene F Strom	1435 Saybrook Road
185	Charles E Hermann	1389 Saybrook Road

AREA DESCRIPTION

Existing Adjacent Land Use

- Undeveloped, forested
- Residential/lawn
- Menunketesuck-Cockaponset Regional Greenway – crosses ROW
- Connecticut River Gateway Zone Greenway – crosses ROW

Road Crossings

- Old Cart Road

RIGHT-OF-WAY DESCRIPTION

Right-of-Way Land Use

- Maintained electric transmission facilities corridor
- Residential
- Menunketesuck-Cockaponset Regional Greenway – crosses ROW
- Connecticut River Gateway Zone Greenway – crosses ROW
- Roadway (Old Cart Road) to west of structures 4395 and 4396 and east of structures 4398 through 4400
- Existing off-ROW access road off of Smith Hill Road within CT DEEP NDDB Area

Scenic Resources

- Connecticut River Gateway Zone Greenway – crosses ROW

Water Resources

- Wetlands 54, 55
- Wetland cover types – PSS/PEM, PEM/PSS/PFO
- Watercourses – Waterbody S25
- Potential Vernal Pool 6 (associated with Wetland 54)

Wetland and Watercourse Crossings

- Wetland 54 – temporary construction mats for access road

Right-of-Way Vegetation

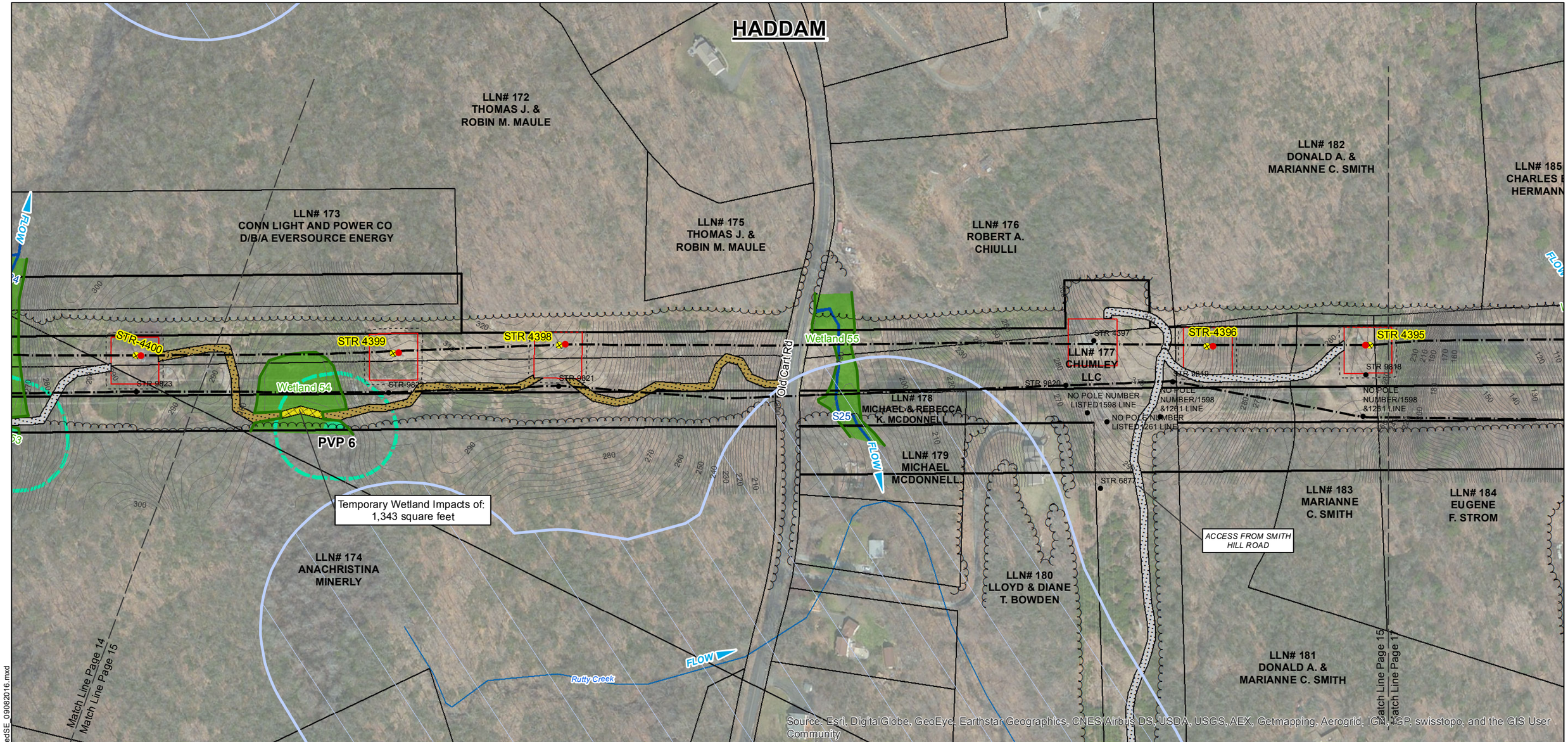
- Scrub-shrub, herbaceous, forested, lawn grass

Access

- Structures 4395 and 4396: from existing off-ROW access road off of Smith Hill Road
- Structures 4398, 4399 and 4400: from existing access road off of Old Cart Road.

Existing Maintained Right-of-Way Width

- 200 feet



STR#	DESCRIPTION	HEIGHT (FT)	FINISH	FOUNDATION
4400	STEEL MONOPOLE	100	WEATHERING STEEL	DRILLED SHAFT
4399	STEEL MONOPOLE	90	WEATHERING STEEL	DRILLED SHAFT
4398	STEEL MONOPOLE	105	WEATHERING STEEL	DRILLED SHAFT
4397	NOT BEING REPLACED	N/A	N/A	N/A
4396	STEEL MONOPOLE	90	WEATHERING STEEL	DRILLED SHAFT
4395	STEEL MONOPOLE	100	WEATHERING STEEL	DRILLED SHAFT

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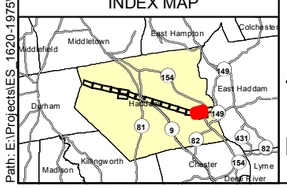

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- Potential Vernal Pool (PVP)
- FEMA Floodway
- FEMA 100-Year Floodplain
- Construction Work Pad
- Temporary Matting
- Existing Improved Access Road
- Existing Unimproved Access Road
- Approximate Existing Tree Line
- Approximate Limit of Disturbance
- MatchLines
- Municipal Boundary
- Hiking Trails
- CT DEEP Property
- CT DEEP NDDB Area

1 inch = 200 feet
0 50 100 200 Feet

NO.	DATE	REVISIONS	BY	CHK	APP	APP

EVERSOURCE

1620/1975 Lines Structure Replacement Project

Haddam, CT

Map Sheet 15 of 17

9/21/2016

AECOM

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MAPSHEET 16 of 17
1620/1975 Lines Structure Replacement Project
Off-ROW Access to Structures 4395 to 4936
Haddam, Connecticut

NO ROW CROSS SECTION – OFF-ROW ACCESS ONLY

ABUTTERS TO PROJECT RIGHT-OF-WAY		
Line List No.	**Owner Name (Now or Formerly)**	**Property Address**
174	Anachristina Minerly	200 Plains Road
177	Chumley LLC	Saybrook Road
180	Lloyd & Diane T Bowden	148 Old Cart Road
181	Donald A. & Marianne C. Smith	42 Smith Hill Road

AREA DESCRIPTION

Existing Adjacent Land Use

- Undeveloped , forested
- Residential
- Menunketesuck-Cockaponset Regional Greenway – crosses ROW
- Connecticut River Gateway Zone Greenway – crosses ROW

Road Crossings

- None

Scenic Resources

- State Highway Route 154 (Connecticut State Scenic Road)

RIGHT-OF-WAY DESCRIPTION

Right-of-Way Land Use

- Smith Hill Road / existing access road off of Smith Hill Road
- Maintained electric transmission facilities corridor – 1261/1598 Lines
- Residences adjacent to Smith Hill Road and existing off-ROW access road
- Existing access road off of Smith Hill Road within CT DEEP NDDB Area
- Menunketesuck-Cockaponset Regional Greenway – crosses ROW
- Connecticut River Gateway Zone Greenway – crosses ROW

Water Resources

- Wetlands – Wetland 57
- Wetland cover types – PEM/PSS
- Watercourses – S25 (Rutty Creek)

Wetland and Watercourse Crossings

- None

Right-of-Way Vegetation

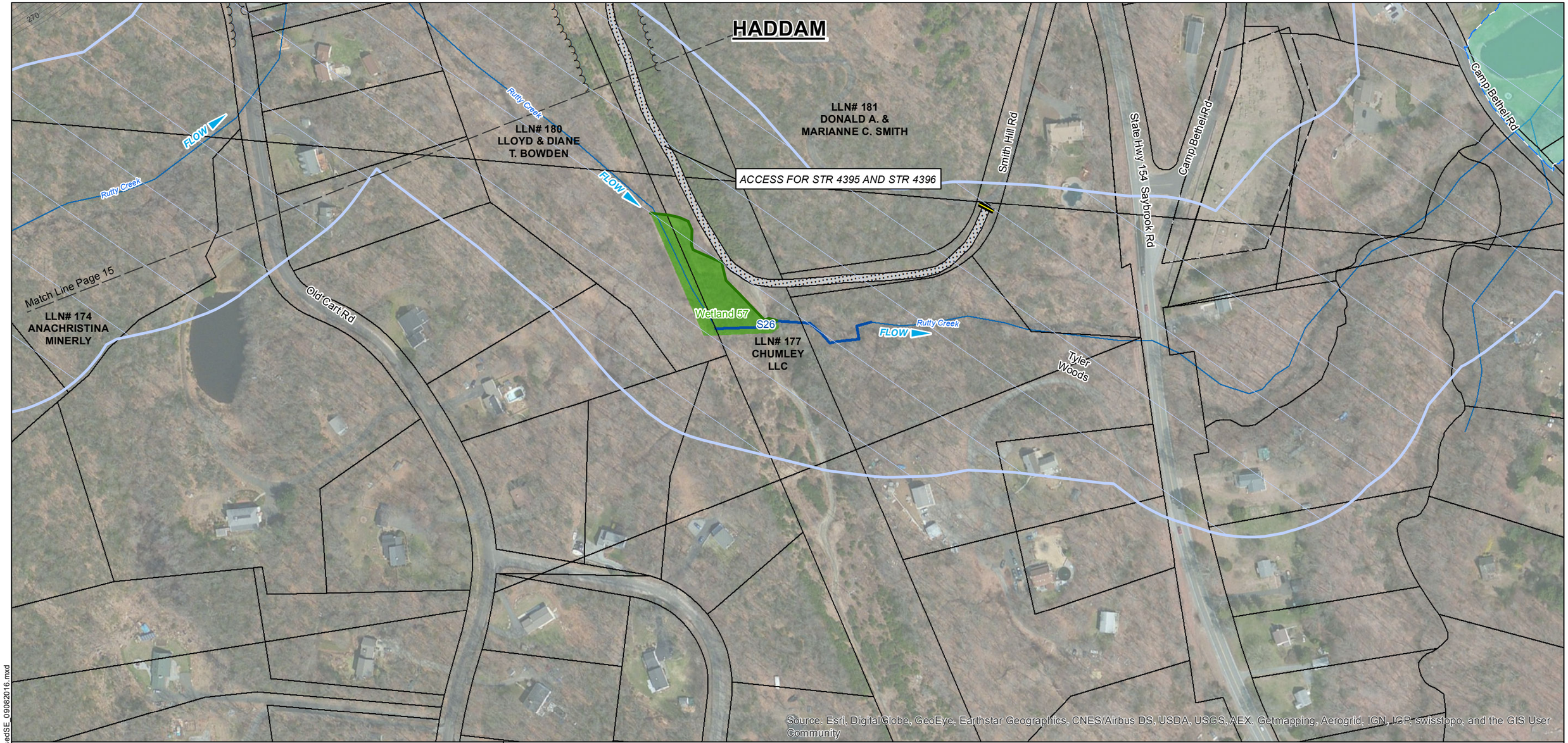
- Scrub-shrub
- Herbaceous
- Forested

Access

- Structures 4395 and 4936: from existing off-ROW access road off of Smith Hill Road

Existing Maintained Right-of-Way Width

- Approximately 175 feet for 1261/1598 Lines



WORK AREA BOUNDARIES IN / NEAR WETLANDS:
1. VEGETATION REMOVAL WILL OCCUR WITHIN THE EXISTING RIGHT-OF-WAY LIMITS AS SHOWN. ADDITIONALLY, DANGER OR HAZARD TREE REMOVAL MAY BE REQUIRED OUTSIDE OF THE VEGETATION REMOVAL LIMITS.
2. ALL PROJECT CONSTRUCTION ACTIVITIES WILL BE CONTAINED WITHIN THE DEPICTED APPROXIMATE LIMIT OF DISTURBANCE ASSOCIATED WITH WORK PADS AND ACCESS ROADSWORK AREA BOUNDARIES IN / NEAR WETLANDS

GENERAL NOTES
1. THE LIMITS OF DISTURBANCE AS SHOWN DEFINE AREAS WHERE VEGETATION REMOVAL AND GRUBBING, GRADING, AND EXCAVATION MAY OCCUR
2. ALL WORK WILL BE CONDUCTED IN ACCORDANCE WITH THE RELEVANT PORTIONS OF EVERSOURCE'S BMP MANUAL: CONNECTICUT CONSTRUCTION AND MAINTENANCE ENVIRONMENTAL REQUIREMENTS (BMP MANUAL), UNLESS MORE STRINGENT PROJECT-SPECIFIC MEASURES APPLY.
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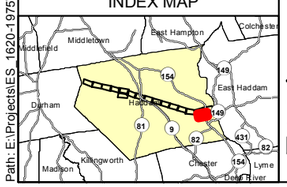
4. EROSION AND SEDIMENTATION CONTROL MEASURES WILL BE INSTALLED DURING CONSTRUCTION, AS REQUIRED, TO COMPLY WITH THE 2002 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL, AND EVERSOURCE'S BMP MANUAL, AND APPLICABLE REGULATORY APPROVALS

INDEX MAP



Legend
- Existing Structure to Remain
- Existing Structure to be Replaced
- Replacement Structure
- Existing Right-of-Way
- Transmission Line to Remain (Approx Centerline)
- 2' Contour Line
- Property Line
- Culvert
- Fence
- Gate
- Delineated Wetland
- Wetland Area
- Delineated Water
- Water Area
- National Hydrography Dataset
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1 inch = 200 feet
0 50 100 200 Feet

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EVERSOURCE

1620/1975 Lines Structure Replacement Project

Haddam, CT

Map Sheet 16 of 17

9/21/2016

AECOM

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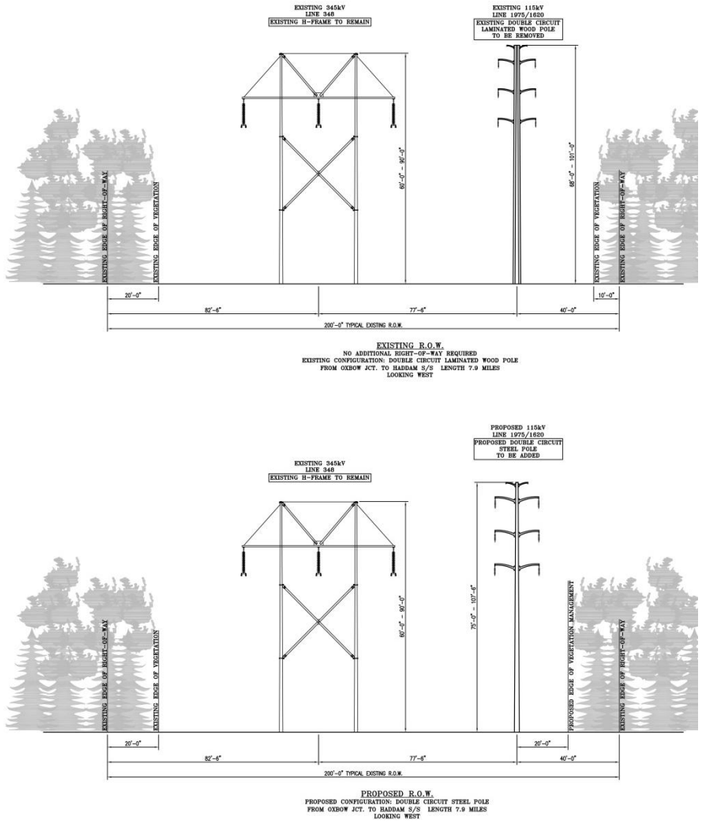
MAPSHEET 17 of 17
1620/1975 Lines Structure Replacement Project
ROW to Haddam Substation
Haddam, Connecticut



ABUTTERS TO PROJECT RIGHT-OF-WAY		
Line List No.	**Owner Name (Now or Formerly)**	**Property Address**
181	Donald A. + Marianne C. Smith	42 Smith Hill Road
182	Donald A. + Marianne C. Smith	Saybrook Road
184	Eugene F Strom	1435 Saybrook Road
185	Charles E Hermann	1389 Saybrook Road
186	Connecticut Light & Power d/b/a Eversource Energy	1384 Saybrook Road
187	Brian & Karen McLean	1426 Saybrook Road
188	Brian & Karen McLean	1426 Saybrook Road
189	Connecticut Light & Power d/b/a Eversource Energy	1384 Saybrook Road
190	Stanley J Kavarsky	1400 Saybrook Road
191	Town of Haddam	Saybrook Road
192	M & T Properties LLC	Rutty Ferry Road
193	Fritz A & Vaun G Dahlgren	14 Beckwith Road
194	Scott W & Michelle W Smigel	12 Beckwith Road

AREA DESCRIPTION

Existing Adjacent Land Use

- Residential
- Undeveloped, forested
- Rutty Creek flooded / emergent marsh
- Connecticut River Gateway Zone Greenway – crosses ROW

Road Crossings

- State Highway 154 (Saybrook Road) – Connecticut State Scenic Road

RIGHT-OF-WAY DESCRIPTION

Right-of-Way Land Use

- Maintained electric transmission facilities corridor
- Haddam Substation
- Forested areas adjacent to substation.
- Residences to the west of access road and substation.
- CT DEEP NDDB Area associated with Rutty Creek in the southern portion of substation

Scenic Resources

- Connecticut River Gateway Zone Greenway – crosses ROW
- State Highway 154 (Saybrook Road) – Connecticut State Scenic Road

Water Resources

- Wetland 56
- Wetland cover type – PSS/PFO
- Watercourses – Waterbody S27

Wetland and Watercourse Crossings

- None

Right-of-Way Vegetation

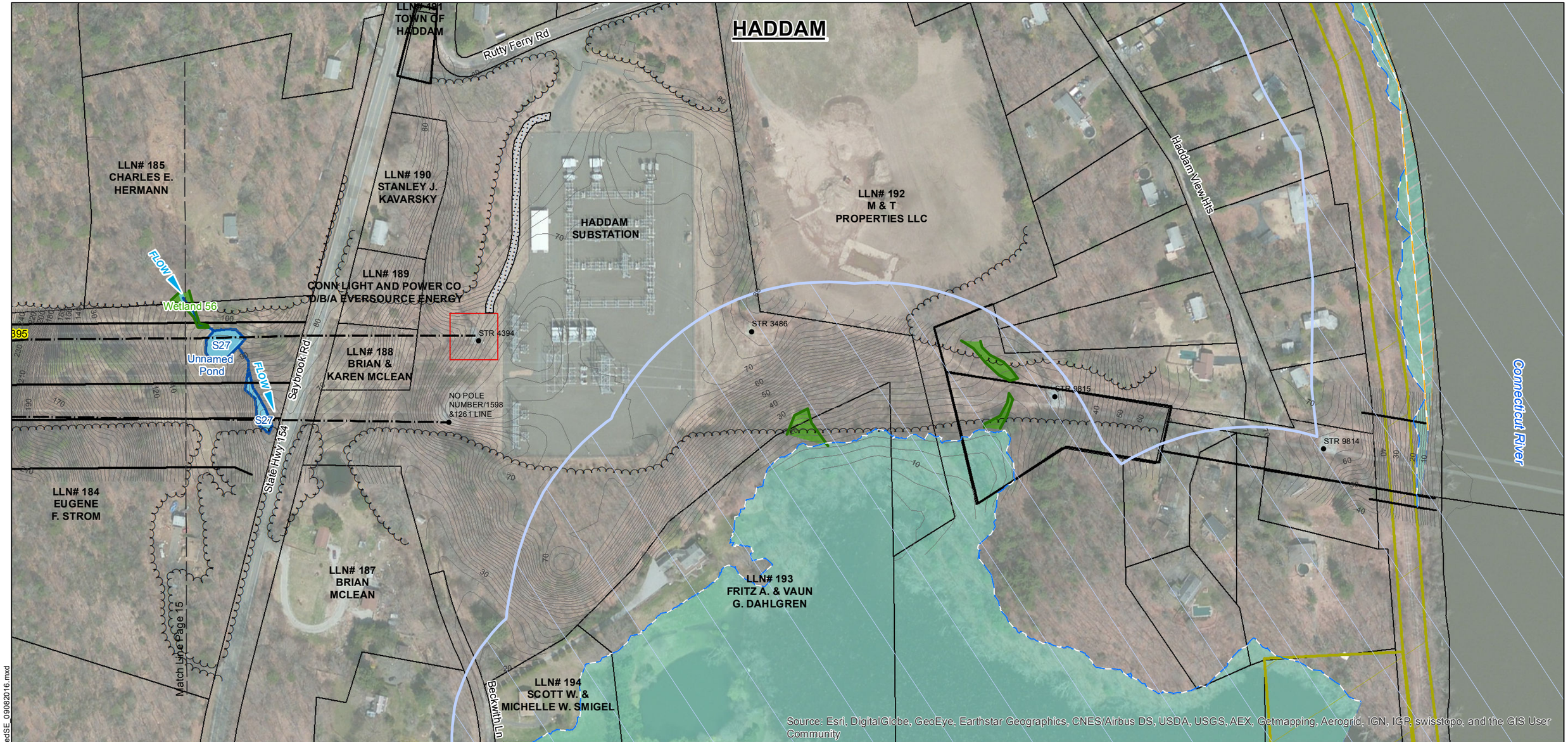
- Scrub-shrub
- Herbaceous
- Forested

Access

- Haddam Substation and ROW: existing developed substation property south of Rutty Ferry Road

Existing Maintained Right-of-Way Width

- 200 feet



STR#	DESCRIPTION	HEIGHT (FT)	FINISH	FOUNDATION
4394	NOT BEING REPLACED	N/A	N/A	N/A

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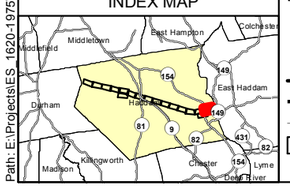

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1 inch = 200 feet
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NO.	DATE	REVISIONS	BY	CHK	APP	APP

EVERSOURCE

1620/1975 Lines Structure Replacement Project

Haddam, CT

Map Sheet 17 of 17

9/21/2016

AECOM

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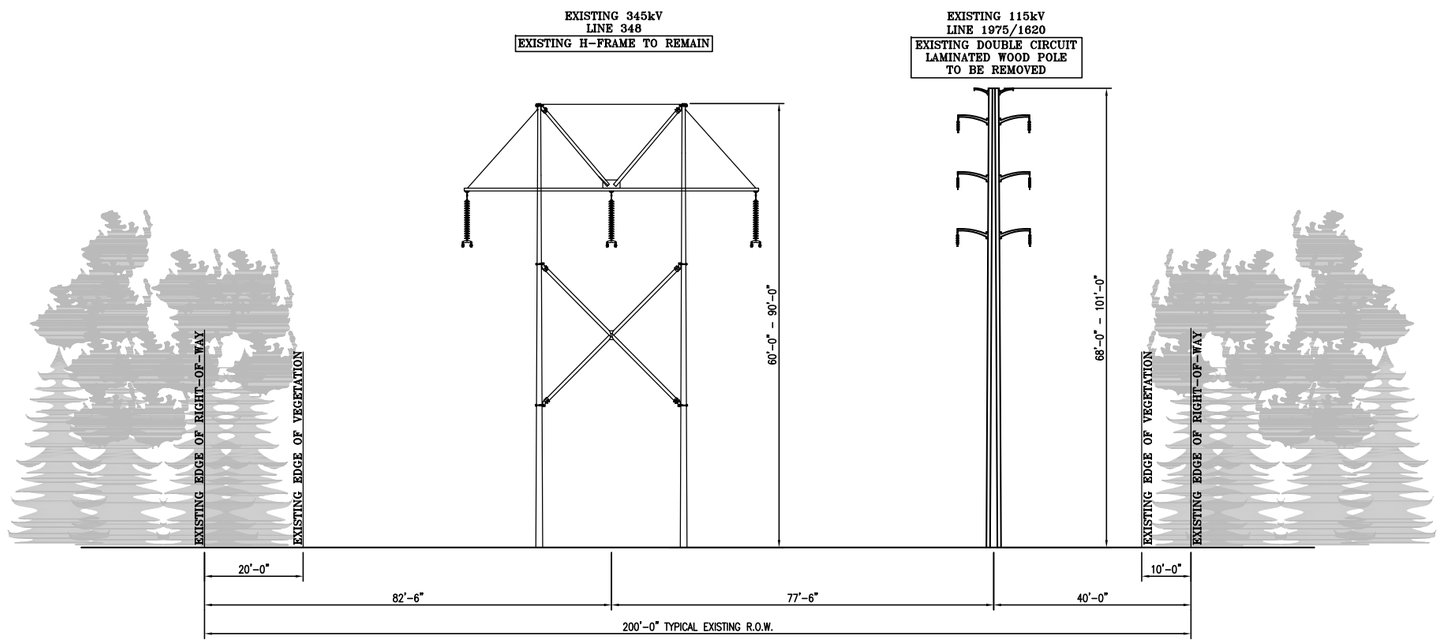
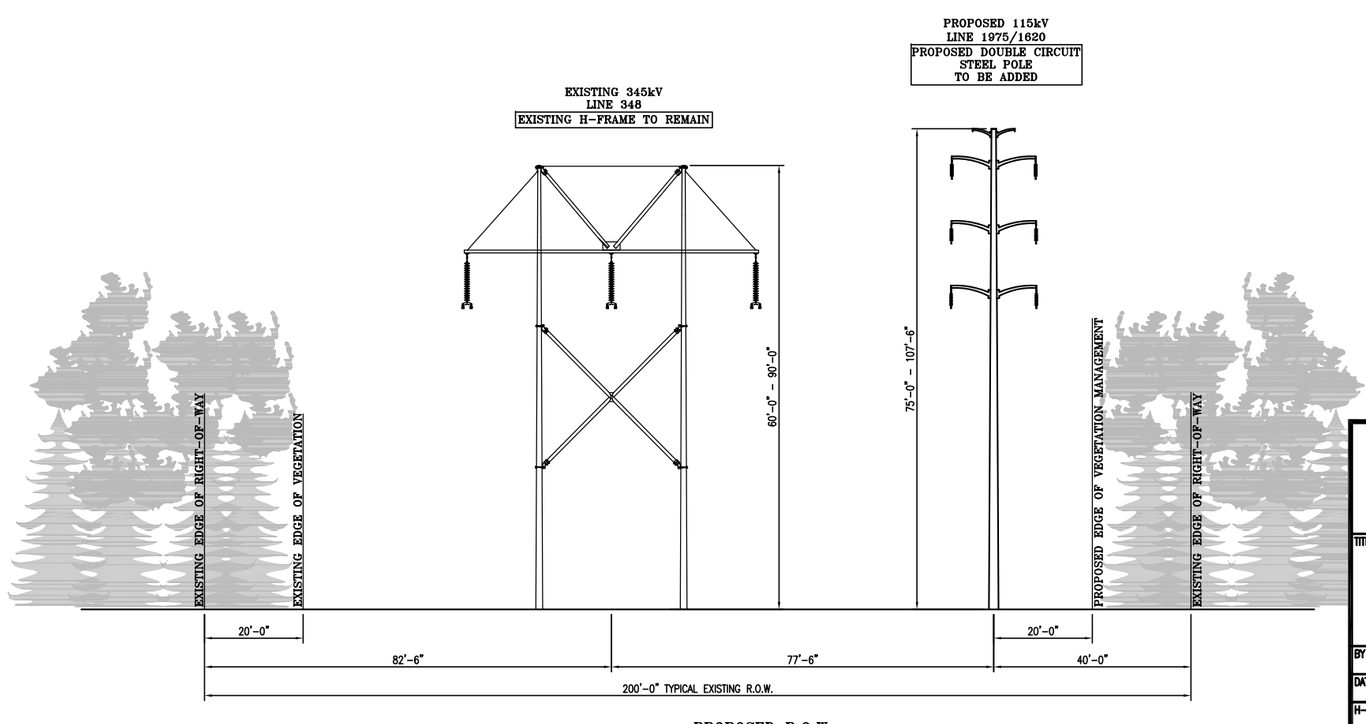
Attachment B
Existing/Proposed ROW Cross Sections



EXISTING R.O.W.

NO ADDITIONAL RIGHT-OF-WAY REQUIRED
EXISTING CONFIGURATION: DOUBLE CIRCUIT LAMINATED WOOD POLE
FROM OXBOW JCT. TO HADDAM S/S LENGTH 7.9 MILES
LOOKING WEST



PROPOSED R.O.W.

PROPOSED CONFIGURATION: DOUBLE CIRCUIT STEEL POLE
FROM OXBOW JCT. TO HADDAM S/S LENGTH 7.9 MILES
LOOKING WEST

EVERSOURCE ENERGY

TITLE

LINE 1620 & 1975
HADDAM S/S TO OXBOW JCT.
TYPICAL R.O.W. CROSS SECTION
TOWN OF HADDAM, CT.

BY	UDB/CAI	CHKD	GTD/CAI	APP	GTD/CAI	APP	
DATE	7/26/16	DATE	7/26/16	DATE	7/26/16	DATE	
H-SCALE	N.T.S.	SIZE	B	FIELD BOOK & PGTDS			
V-SCALE	N.T.S.	V.S.		R.E. DWG			
R.E. PROJ. NUMBER				DWG NO.	XS-1 SKETCH		

Attachment C
Wetlands and Watercourses Report

EVERSOURCE ENERGY

1620/1975 LINES STRUCTURE REPLACEMENT PROJECT

WETLANDS AND WATERCOURSES REPORT

Prepared for:

The Connecticut Light and Power Company
doing business as

Eversource Energy
56 Prospect Street
P.O. Box 270
Hartford, CT 06103

Prepared by:

AECOM
500 Enterprise Drive
Rocky Hill, CT 06067

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Table of Contents

List of Appendices

1.0 Introduction

The Connecticut Light and Power Company, doing business as Eversource Energy (Eversource), proposes to replace 64 structures along an approximate 8 mile section of its existing 115-kV 1620/1975 Lines right-of-way (ROW) from Oxbow Junction to Haddam Substation in the town of Haddam, Connecticut (Project). This report provides a summary of wetland and watercourse inventories and field delineations conducted by AECOM within the Project area. Specifically, this report discusses applicable federal and state wetland and watercourse regulations, the methodologies used to identify the wetland and watercourse resources encountered along the Project and summarizes the findings of the surveys. These field delineations were conducted to identify both federal and State of Connecticut jurisdictional water resources.

Tables listing all wetlands and watercourses identified during the course of the surveys are located in Appendix A. Appendix B contains the wetland and watercourse mapping associated with the Project. Representative wetland and watercourse photographs are located in Appendix C.

1.1 Project Background and Summary of Proposed Action

The purpose of the Project is to replace 64 existing structures consisting primarily of laminate wood poles and some wood H-frames on the 1620/1975 Lines between Oxbow Junction and Haddam Substation. The existing wood and laminate wood poles within this section of ROW were originally placed into service in the 1970s and are exhibiting age-related degradation. The new direct-embedded steel monopole structures on new drilled shaft foundations would be utilized for all structures and self-supported structures on drilled shaft foundations would be utilized for all angle structures. The new structures would be approximately ten feet taller than the existing double-circuit pole structures due to varying ground elevations. The rebuild is one component of Eversource's ongoing commitment to strengthen infrastructure reliability.

Each structure replacement site would require use of a temporary work pad measuring approximately 100 feet by 100 feet centered on the structure. The configuration of individual work pads may vary slightly based on site-specific environmental, engineering, or cultural resources constraints. The contractor will utilize existing access roads to the maximum extent practicable.

1.2 Physiographic and Geologic Overview

The Project area is situated within the Central Valley physiographic region of Connecticut[1]. This region is characterized by variably hilly terrain with local areas of considerable topographic relief and rugged hills separating numerous small rivers that drain into the Connecticut River.

Bedrock geology mapping indicates the Project area traverses extensive areas of amphibolite, gneiss, and schist. The landscape of Connecticut was heavily shaped by the late Wisconsinan glaciation episode from the Laurentide ice sheet and the associated outwash meltwaters which resulted in a flattened Connecticut River Valley. The resulting surficial geology of the corridor is characterized by glacial-laid deposits of thin till and glaciofluvial sand/gravel. No areas of extensive alluvial and floodplain deposits occur within the Project area.

[1] Connecticut Geologic Survey Department of Energy and Environmental Protection. 1990, revised 2013.

2.0 Wetland and Watercourse Regulations

In Connecticut, wetlands and watercourses are subject to state or federal jurisdiction based upon the Federal Clean Water Act ("CWA"; 33 U.S.C. 1251 *et seq.*) and the Connecticut Inland Wetland and Watercourses Act ("IWWA"; C.G.S. Section 22a-36 through 45) and implementing regulations (R.C.S.A. Section 22a-39-1 to 22a-39-15). The following wetland and watercourse regulations are applicable to the Project.

2.1 Section 404 – Clean Water Act

Wetlands, springs, and other waters of the United States are regulated under Section 404 CWA (33 U.S.C. 1344) by the United States Army Corps of Engineers ("Corps"). Federal jurisdictional "waters of the United States" include:

1. All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
2. All interstate waters including interstate wetlands;
3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:
    i. Which are or could be used by interstate or foreign travelers for recreational or other purposes; or
    ii. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
    iii. Which are used or could be used for industrial purpose by industries in interstate commerce;
4. All impoundments of waters otherwise defined as waters of the United States under the definition;
5. Tributaries of waters identified in paragraphs (1)-(4) above;
6. The territorial seas;
7. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (1)-(6) above.

According to the *1987 Corps of Engineers Wetland Delineation Manual*[2] (Corps Manual), areas must exhibit three distinct characteristics to be considered wetlands jurisdictional under Section 404 of the CWA:

- Hydrophytic Vegetation: Plants growing in water or in a substrate that is at least periodically deficient in oxygen during a growing season as a result of excessive water content;
- Hydric Soils: Soils that, in an undrained condition, are saturated, flooded, or ponded long enough during a growing season to develop an anaerobic condition that supports the growth and regeneration of hydrophytic vegetation; and,

[2] Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual*. Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.

- Wetland Hydrology: Inundation or saturation by surface or groundwater at a frequency and duration during the growing season sufficient to support a prevalence of hydrophytic vegetation typically adapted for life in saturated soil conditions.

In January 2012, the USACE issued a *Regional Supplement to the Corps of Engineers Delineation Manual*[3] (Regional Supplement), which provides further guidance for wetland delineations in the northeastern United States. The Regional Supplement provides wetland indicators, delineation guidance, and other information specific to the Northcentral and Northeast Regions, supplementing the 1987 USACE Manual. Indicators and procedures in the Regional Supplement are designed to identify wetlands as defined jointly by the USACE (33 CFR 328.2) and the U.S. Environmental Protection Agency (40 CFR 230.3) and subject to regulation under Section 404 of the CWA.

2.2 Connecticut Inland Wetland and Watercourses Act

The State of Connecticut Department of Energy and Environmental Protection ("DEEP") regulates work in and around inland wetlands under the IWWA (C.G.S. Section 22a-36 through 45) and implementing regulations (R.C.S.A. Section 22a-39-1 to 22a-39-15). Typically, the state statute is implemented through the Inland Wetlands and Watercourse Regulations as administered by individual municipalities.

Under Section 2 of the IWWA, a wetland is defined as "land, including submerged land…which consists of poorly drained, very poorly drained, alluvial and floodplain soils as defined by the National Cooperative Soils Survey. Such areas may include filled, graded or excavated sites which possess an aquic (saturated) moisture regime as defined by the United States Department of Agriculture (USDA) Cooperative Soil Survey."

Watercourses are defined in the IWWA as "rivers, streams, brooks, waterways, lakes, ponds, marshes, swamps, bogs and all other bodies of water, natural or artificial, vernal or intermittent, public or private, which are contained within, flow through or border upon the state or any portion thereof." The IWWA defines Intermittent Watercourses as having a defined permanent channel bed and bank and the occurrence of two of the following: A) evidence of scour or deposits of recent alluvium or detritus, B) the presence of standing or flowing water for a duration of longer than a particular storm incident, or C) the presence of hydrophytic vegetation.

[3] U.S. Army Corps of Engineers. 2011a. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0)*, ed. J.S. Wakeley, R.W. Lichvar, C.V. Noble, and J.F. Berkowitz. ERDC/EL TR-12-1. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

3.0 Wetland and Watercourse Delineation Procedures

On behalf of Eversource, AECOM conducted wetland and watercourse identification and delineations along the Project's existing ROW corridor between January and August 2016 to determine state and federal wetland boundaries in accordance with applicable state and federal regulations. The methods of investigation and procedures used include pre-survey desktop investigations and on-site field surveys to determine the wetland and watercourse resource areas within the Project area.

3.1 Pre-survey Desktop Investigations

Prior to the commencement of field surveys, AECOM reviewed information from multiple sources to determine the potential extent of state and federal wetlands within the Project area. Pre-survey information reviewed included:

- United States Geological Survey (USGS) 7.5-minute topographical quadrangles;
- USGS National Hydrography Dataset (NHD);
- National Wetlands Inventory (NWI) map data;
- Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) data;
- U.S. Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) web soil surveys; and,
- CT DEEP inland wetland soils mapping.

3.2 Field Surveys

The wetland delineation methodologies outlined in the Corps Manual and the Regional Supplement and definitions included in the IWWA were used in conjunction with NRCS soil surveys to identify and delineate wetlands along Project area. During the process of delineating wetlands within the ROW, both state and federal methodologies were employed and state and federal wetland criteria were evaluated. In order to meet federal jurisdictional wetland status, wetlands must meet the hydric soil, hydrophytic vegetation, and wetland hydrology criteria per the Corps Manual and Regional Supplement. Connecticut-only jurisdictional wetlands consist of areas of poorly drained, very poorly drained, alluvial, and floodplain soils.

Field surveys were initiated with an inspection of the ROW to identify soil types, topographic and drainage features, and plant associations that would indicate the potential for jurisdictional wetland classification. Soil profiles were sampled using a Dutch auger or a tile spade ("sharpshooter") to determine if any alluvial, floodplain, poorly drained, very poorly drained or hydric soil indicators were present. The indicator status of dominant plant species in each stratum was evaluated in the field to determine whether a hydrophytic plant association was present. Indicators of wetland hydrology were also observed and recorded. Specific methods for characterizing and evaluating the soil, vegetation, and hydrologic indicators are described below.

3.2.1 Soils

At the center of each wetland data plot, AECOM observed and documented the soil profile morphology to classify the soil type and depth to evidence of aquic conditions. Typically, a soil pit was dug to 20 inches with a Dutch auger or tile spade to provide a soil profile for

examination. The information collected for each soil profile included soil horizons, depth, texture, color, and the presence or absence of redoximorphic features (mottles and other features). Colors of the soil matrix and mottles were identified using Munsell Soil Color Charts. AECOM based all hydric soil determinations on criteria established in the Corps Manual, Regional Supplement, and *Field Indicators for Identifying Hydric Soils in New England* (NEIWPCC 2004). Additionally, AECOM noted the presence of any saturation and/or standing water encountered during the soil profile description.

3.2.2 Vegetation

Species abundance in both upland and wetland communities was visually estimated. Dominant trees and shrubs/saplings were recorded within a 30-foot and 15-foot radius, respectively, from the center of each documentation plot. Woody vines were recorded within a 30-foot radius plot. Dominant herbaceous vegetation was recorded within a 5-foot radius plot. AECOM identified plant species using appropriate botanical reference material for the region. The hydrophytic indicator status of each species was identified using *The National Wetland Plant List: 2014 Update of Wetland Ratings*[4] (Lichvar et al. 2014) for wetlands delineated prior to May 1, 2016, or *The National Plant List: 2016 Wetland Ratings*[5] (Lichvar et al. 2016) for wetlands delineated after May 1, 2016.

Indicators of hydrophytic vegetation are satisfied if the results of the rapid assessment include all species rated as OBL or FACW (Indicator 1), the dominance test is greater than 50% (Indicator 2), or the prevalence index is less than or equal to 3.0 (Indicator 3) based on the Corps Wetland Determination Data Form[6].

3.2.3 Hydrology

The term wetland hydrology encompasses all hydrologic characteristics for areas that are periodically inundated or have soils saturated to the surface at some time during the growing season. Site hydrology was evaluated during field surveys by initially observing whether the soil at the surface was inundated or saturated. If the ground surface was dry, the depth to freestanding groundwater or saturated soil was measured, and the presence or absence of other indicators of wetland hydrology (e.g., drift lines, water-stained leaves, etc.) was noted. The wetland hydrology criterion was met if one or more primary or two or more secondary field indicators were present.

3.2.4 Wetland and Watercourse Boundary Flagging

For the purposes of documenting and organizing the wetland and watercourse information on maps and tables for this Project, each resource was assigned a unique alpha-numeric code. Wetlands and watercourses were numbered sequentially from the northwestern extent of the Project to the southeast. Wetlands were labeled with a “Wetland” prefix and watercourses were

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4 Lichvar, R.W., M. Butterwick, N.C. Melvin, and W.N. Kirchner. 2014. The National Wetland Plant List: 2014 Update of Wetland Ratings. Phytoneuron 2014-41: 1-42. http://wetland_plants.usace.army.mil/

5 Lichvar, R.W., D.L. Banks, W.N.Kirchner, and N.C. Melvin. 2016. The National Plant List: 2016 wetland ratings. Phytoneuron 2016-30: 1-17. http://wetland_plants.usace.army.mil/

6 US Army Corps of Engineers 2011b. Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region Data Forms. ERDC/EL TR-09-19. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

labeled with an "S" prefix. Tables 1 and 2 (Attachment A) list the delineated wetlands and watercourses identified within the Project area, respectively.

During the field investigations, the boundaries of each resource were identified by sequentially-numbered vinyl flagging tied to vegetation and spaced at regular intervals. Wetland/upland boundaries were flagged with pink ribbon and watercourses were flagged with blue ribbon. Watercourses less than six feet wide were field-identified with a single series of flags established along the centerline of the stream. In instances where the watercourse was greater than six feet wide, the ordinary high water mark (OHWM) boundary on each bank was flagged.

3.2.5 Global Positioning System Mapping

All wetland boundary flags, wetland/upland data plots, and watercourse centerline or OHWM boundary flags were located using a hand-held Trimble® Global Positioning System (GPS) unit. A minimum of 30 static measurements with a positional dilution of precision (PDOP) of 6.0 were collected at each survey point to obtain sub-meter accuracy. Real time positions were then post-processed for additional accuracy using static data available at public continuously operating reference stations (CORS) and referenced to the Connecticut State Plane Coordinate System NAD 83.

3.3 Wetland Classification

While in the field, AECOM soil and wetland scientists classified the various wetlands and watercourses according to the "Cowardin system", which is a process discussed in *Classification of Wetlands and Deepwater Habitats of the United States*[7]. Identified wetlands were classified as Palustrine Forested (PFO), Palustrine Scrub-Shrub (PSS), or Palustrine Emergent (PEM), all of which are further described below. In some cases, a wetland complex contained more than one wetland classification type. In those situations, each wetland type is listed and the first classification type represents the more dominant characteristic. Wetland vegetation found in these community types within the Project area are described in Section 4.0.

3.3.1 Palustrine Forested Wetlands (PFO)

Palustrine forested wetlands or PFO are characterized by woody vegetation that is six meters (approximately 20 feet) tall or taller. These areas normally contain an overstory of trees, an understory of young trees and/or shrubs, and an herbaceous layer. These wetland types are located predominantly in unmanaged or non-cleared areas of the existing ROW or in adjacent off-ROW areas.

3.3.2 Palustrine Scrub-Shrub Wetlands (PSS)

Palustrine scrub-shrub wetlands or PSS are typically dominated by woody vegetation less than six meters (approximately 20 feet) tall. Areas classified as scrub-shrub cover types may represent a successional stage that through natural processes would transition to a forested wetland; or may contain trees or shrubs that are small and/or stunted due to environmental conditions. Within the Project area, PSS wetlands often occur within the ROW as a result of ongoing routine vegetation management practices.

[7] Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. United States Fish and Wildlife Service Biological Report 79/31. Washington, D.C.

3.3.3 Palustrine Emergent Wetlands (PEM)

Palustrine emergent wetlands or PEM are characterized by erect, rooted, herbaceous hydrophytes not including mosses and lichens. These wetlands maintain the same appearance year after year and are typically dominated by perennial plants that are present for the majority of the growing season.

3.4 Watercourses

According to the IWWA, “Rivers, streams, brooks, waterways, lakes, ponds, marshes, swamps, bogs and all other bodies of water, natural or artificial, vernal or intermittent, public or private, which are contained within, flow through or border upon the state or any portion thereof” are considered watercourses. The “top of bank”, or OHWM, was used to demarcate the limits of a watercourse when no wetlands were adjacent to the channel. Watercourses were investigated to determine if they are listed as a National Wild and Scenic River under the National Wild and Scenic Rivers Act (16 U.S.C. §§ 1271-1287) or rivers designated by the CT DEEP Protected Rivers Act (C.G.S. §§ 25-200 through 25-210). Water quality designations were determined using CT DEEP mapping resources.

3.5 Post-Survey Desktop Analysis

The wetland and watercourse boundaries were plotted on aerial imagery and subsequently reviewed and confirmed by AECOM field personnel. The aerial-based maps show the locations of the delineated resources relative to the proposed limits of the Project.

4.0 Results

A total of 57 wetlands and 30 watercourses were identified within Eversource's ROW or fee-owned properties in proximity to proposed Project activities, as shown on mapping presented in Appendix A. A summary of the wetlands and watercourses are presented in Tables 1 and 2, respectively, in Appendix A.

4.1 Wetlands

4.1.1 Wetland Vegetation

Emergent wetlands within the Project area are frequently dominated by a wide variety of perennial hydrophytes. Common dominant species observed within emergent wetlands include sensitive fern (*Onoclea sensibilis*), fowl blue grass (*Poa palustris*), fowl manna grass (*Glyceria striata*), common reed (*Phragmites australis*), reed canary grass (*Phalaris arundinacea*), soft rush (*Juncus effusus*), Canadian rush (*Juncus canadensis*), uptight sedge (*Carex stricta*), broad-leaved cattail (*Typha latifolia*), late goldenrod (*Solidago gigantea*), fringed willow herb (*Epilobium ciliatum*), and skunk cabbage (*Symplocarpus foetidus*).

Scrub-shrub wetlands are the most common wetland community type encountered within the Project area. Common dominant woody species observed within scrub-shrub wetlands include multiflora rose (*Rosa multiflora*), blackberry (*Rubus* spp.), broad-leaf meadowsweet (*Spirea latifolia*), steeplebush (*S. tomentosa*), highbush blueberry (*Vaccinium corymbosum*), maleberry (*Lyonia ligustrina*), red osier dogwood (*Cornus alba*), silky dogwood (*C. amomum*), winterberry (*Ilex verticillata*), speckled alder (*Alnus incana*), southern arrow-wood (*Viburnum dentatum*), coastal sweet pepperbush (*Clethra alnifolia*), and American witch hazel (*Hamamelis virginiana*).

Forested wetlands within the Project area are limited to areas outside the existing maintained ROW. The overstory of these communities are dominated by trees such as red maple (*Acer rubrum*), eastern cottonwood (*Populus deltoides*), yellow birch (*Betula alleghaniensis*), and black birch (*B. lenta*). Common herbaceous species associated with forested wetlands include sensitive fern, cinnamon fern (*Osmundastrum cinnamomeum*), skunk cabbage, and poison ivy (*Toxicodendron radicans*).

4.1.2 Wetland Soils

Multiple soil types representing a wide variety of soil series designations were identified during this wetland and watercourse inventory. The soil types in the various wetlands were identified as poorly drained to very poorly drained mineral soil with varying amounts of organic matter, and included fine sandy loams, silt loams, sandy loams, and mucks that appear to have formed in parent material including glacial till and glacial outwash. AECOM did not document the presence of any well-drained or moderately well-drained alluvial or floodplain soils.

All areas delineated as wetland consisted of poorly-drained and/or very poorly drained soils (including the alluvial and floodplain soils encountered along Hill Brook and Turkey Hill Brook) that exhibited various field indicators for classification as hydric soils, had a predominance of hydrophytic vegetation, and indicators of hydrology. Therefore, state and federal wetland boundaries coincide for all delineated wetlands encountered within the Project area.

The mapped soil series and drainage classification associated with each wetland is included within the wetland summary table (Table 1) in Appendix A.

4.1.3 Wetland Hydrology

Most of the wetlands encountered within the Project area are classified as having a seasonally flooded or seasonally saturated water regime. Wetland hydrology indicators were observed in each wetland area. Primary hydrology indicators observed included surface water/inundation, high water table, saturated soils, water marks on vegetation, water stained leaves, and oxidized rhizospheres on living roots. Common secondary indicators observed include drainage patterns in wetlands, geomorphic position, micro-topographical relief, and FAC-neutral test.

4.2 Watercourses

A total of 30 watercourses were identified within the Project area, and are included in the watercourse summary table (Table 2) in Appendix A. These include 15 perennial and 15 intermittent watercourses, respectively.

No watercourses along the Project fall under the jurisdiction of the National Wild and Scenic Rivers Act or are designated as wild and scenic under the CT DEEP Protected Rivers Act.

Appendix A
Wetland and Watercourse Summary Tables

Table 1 – Summary of Wetlands Delineated along the 1620/1975 Line

Table 2 – Summary of Watercourses Delineated along the 1620/1975 Line

Table 1. Summary of Wetlands along the 1620/1975 Line Maintenance Project.

Wetland ID	Map Sheet	Wetland Type	Potential Vernal Pool	NRCS Mapped Soil Series	Drainage Class	Associated Watercourse	General Description
Wetland 1	1	PEM/PFO		Ridgebury, Leicester, and Whitman soils, extremely stony (Hydric)	Poorly Drained	S1, S1-A	Emergent marsh within maintained ROW and forested wetland outside maintained ROW associated with perennial stream.
				Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky	Well Drained		
Wetland 2	1	PSS		Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky	Well Drained	S2	Emergent marsh within maintained ROW associated with perennial stream.
Wetland 3	1	PFO		Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky	Well Drained	S2	Low-lying forested wetland adjacent to access road associated with perennial stream.
Wetland 4	1	PFO		Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky	Well Drained	S2	Low-lying forested wetland near access road associated with perennial stream.
Wetland 5	1	PSS		Ridgebury, Leicester, and Whitman soils, extremely stony (Hydric)	Poorly Drained		Low-lying scrub-shrub wetland within maintained ROW.
				Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky	Well Drained		
Wetland 6	1	PEM/PSS		Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky	Well Drained		Low-lying emergent marsh/scrub-shrub wetland complex within maintained ROW.
Wetland 7	2	PEM		Hollis-Chatfield-Rock outcrop complex, 15 to 45 percent slopes	Somewhat Excessively Drained		Low-lying emergent marsh within maintained ROW.
Wetland 8	2	PSS		Ridgebury, Leicester, and Whitman soils, extremely stony (Hydric)	Poorly Drained		Low-lying scrub-shrub wetland within maintained ROW.
				Hollis-Chatfield-Rock outcrop complex, 15 to 45 percent slopes	Somewhat Excessively Drained		
Wetland 9	2	PSS		Ridgebury, Leicester, and Whitman soils, extremely stony (Hydric)	Poorly Drained		Low-lying scrub-shrub wetland within maintained ROW.
				Hollis-Chatfield-Rock outcrop complex, 15 to 45 percent slopes	Somewhat Excessively Drained		
Wetland 10	2	PEM/PSS	X	Hollis-Chatfield-Rock outcrop complex, 15 to 45 percent slopes	Somewhat Excessively Drained		Low-lying emergent marsh/ scrub-shrub wetland complex within maintained ROW.

Table 1. Summary of Wetlands along the 1620/1975 Line Maintenance Project.

Wetland ID	Map Sheet	Wetland Type	Potential Vernal Pool	NRCS Mapped Soil Series	Drainage Class	Associated Watercourse	General Description
Wetland 11	2	PSS		Hollis-Chatfield-Rock outcrop complex, 15 to 45 percent slopes	Somewhat Excessively Drained		Low-lying scrub-shrub wetland within maintained ROW.
Wetland 12	3	PEM/PSS/ PFO		Hollis-Chatfield-Rock outcrop complex, 15 to 45 percent slopes	Somewhat Excessively Drained		Low-lying emergent marsh/ scrub-shrub wetland complex within maintained ROW and forested wetland outside maintained ROW.
Wetland 13	3	PSS		Hollis-Chatfield-Rock outcrop complex, 15 to 45 percent slopes	Somewhat Excessively Drained		Scrub-shrub wetland on hillslope within maintained ROW.
Wetland 14	3	PEM		Agawam fine sandy loam, 3 to 8 percent slopes	Well Drained	S3, S3-A	Low-lying emergent marsh associated with channelized portion of a perennial stream located within maintained ROW.
				Saco silt loam (Alluvial/Hydric)	Very Poorly Drained		
Wetland 15	4	PEM		Ridgebury, Leicester, and Whitman soils, extremely stony (Hydric)	Poorly Drained	S4	Emergent marsh associated with floodplain of perennial stream within an active pasture and field within existing ROW.
				Raypol silt loam (Hydric)	Poorly Drained		
				Agawam fine sandy loam, 3 to 8 percent slopes	Well Drained		
				Sutton fine sandy loam, 3 to 8 percent slopes	Moderately Well Drained		
				Saco silt loam (Alluvial/Hydric)	Very Poorly Drained		
Wetland 16	4	PEM		Raypol silt loam (Hydric)	Poorly Drained	S4	Emergent marsh associated with floodplain of perennial stream within an active pasture and field within existing ROW.
				Agawam fine sandy loam, 0 to 3 percent slopes	Well Drained		
				Saco silt loam (Alluvial)	Very Poorly Drained		
Wetland 17	4	PEM/PSS		Raypol silt loam (Hydric)	Poorly Drained	S4, S4-A	Emergent marsh/scrub-shrub wetland complex associated with floodplain of perennial stream within maintained ROW.
				Agawam fine sandy loam, 0 to 3 percent slopes	Well Drained		
				Saco silt loam (Alluvial)	Very Poorly Drained		

Table 1. Summary of Wetlands along the 1620/1975 Line Maintenance Project.

Wetland ID	Map Sheet	Wetland Type	Potential Vernal Pool	NRCS Mapped Soil Series	Drainage Class	Associated Watercourse	General Description
Wetland 18	4	PEM/PSS/ PFO		Ridgebury, Leicester, and Whitman soils, extremely stony (Hydric)	Poorly Drained	S6	Low-lying emergent marsh/scrub-shrub wetland complex within maintained ROW and forested wetland outside maintained ROW associated with perennial stream.
				Wethersfield loam, 8 to 15 percent slopes, very stony	Well Drained		
Wetland 19	5	PFO		Wethersfield loam, 8 to 15 percent slopes, very stony	Well Drained		Forested wetland located outside maintained ROW.
Wetland 20	5	PSS		Ridgebury, Leicester, and Whitman soils, extremely stony (Hydric)	Poorly Drained	S10	Scrub-shrub wetland located along fringe of perennial stream within maintained ROW.
Wetland 21	5	PFO		Ridgebury, Leicester, and Whitman soils, extremely stony (Hydric)	Poorly Drained	S10	Forested wetland located along fringe of a perennial stream outside maintained ROW.
Wetland 22	5	PSS/PFO		Ridgebury, Leicester, and Whitman soils, extremely stony (Hydric)	Poorly Drained	S11	Low-lying scrub-shrub wetland within ROW and forested wetland outside maintained ROW associated with an intermittent stream.
				Wethersfield loam, 15 to 25 percent slopes	Well Drained		
Wetland 23	5	PFO		Ridgebury, Leicester, and Whitman soils, extremely stony (Hydric)	Poorly Drained	S11	Forested wetland located outside maintained ROW.
				Wethersfield loam, 15 to 25 percent slopes	Well Drained		
Wetland 24	7	PEM		Ridgebury, Leicester, and Whitman soils, extremely stony (Hydric)	Poorly Drained		Low-lying emergent marsh within maintained ROW adjacent to Silver Springs Drive.
				Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky	Well Drained		
Wetland 25	7	PFO		Ridgebury, Leicester, and Whitman soils, extremely stony (Hydric)	Poorly Drained		Low lying forested wetland outside maintained ROW near Silver Springs Drive.
				Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky	Well Drained		
Wetland 26	7	PSS		Ridgebury, Leicester, and Whitman soils, extremely stony (Hydric)	Poorly Drained		Low-lying scrub-shrub wetland within maintained ROW adjacent to Silver Springs Drive.
				Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky	Well Drained		

Table 1. Summary of Wetlands along the 1620/1975 Line Maintenance Project.

Wetland ID	Map Sheet	Wetland Type	Potential Vernal Pool	NRCS Mapped Soil Series	Drainage Class	Associated Watercourse	General Description
Wetland 27	9	PSS		Ridgebury, Leicester, and Whitman soils, extremely stony (Hydric)	Poorly Drained		Low-lying scrub-shrub wetland within maintained ROW near Morris Hubbard Road and adjacent to existing access road.
				Canton and Charlton soils, 3 to 8 percent slopes, very stony	Well Drained		
Wetland 28	9	PFO	X	Ridgebury, Leicester, and Whitman soils, extremely stony (Hydric)	Poorly Drained		Low-lying forested wetland outside maintained ROW near Morris Hubbard Road and adjacent to existing access road.
Wetland 29	9	PSS	X	Ridgebury, Leicester, and Whitman soils, extremely stony (Hydric)	Poorly Drained		Low-lying scrub-shrub wetland within maintained ROW.
				Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky	Well Drained		
				Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky	Well Drained		
				Paxton and Montauk fine sandy loams, 3 to 8 percent slopes, very stony	Well Drained		
Wetland 30	9	PSS		Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky	Well Drained		Small scrub-shrub wetland within maintained ROW located adjacent to existing unimproved access road.
Wetland 31	9	PSS		Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky	Well Drained		Scrub-shrub wetland located within maintained ROW adjacent to existing unimproved access road.
				Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky	Well Drained		
Wetland 32	9	PSS		Ridgebury, Leicester, and Whitman soils, extremely stony (Hydric)	Poorly Drained		Low-lying scrub-shrub wetland located within maintained ROW adjacent to existing unimproved access road.
				Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky	Well Drained		
Wetland 33	9	PSS		Ridgebury, Leicester, and Whitman soils, extremely stony (Hydric)	Poorly Drained		Low-lying scrub-shrub wetland located within maintained ROW adjacent to existing unimproved access road.
				Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky	Well Drained		

Table 1. Summary of Wetlands along the 1620/1975 Line Maintenance Project.

Wetland ID	Map Sheet	Wetland Type	Potential Vernal Pool	NRCS Mapped Soil Series	Drainage Class	Associated Watercourse	General Description
Wetland 34	10	PSS		Ridgebury, Leicester, and Whitman soils, extremely stony (Hydric)	Poorly Drained	S14	Low-lying scrub-shrub wetland within maintained ROW associated with perennial stream.
				Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky	Well Drained		
Wetland 35	10, 11	PSS/PFO		Walpole sandy loam (Hydric)	Poorly Drained	S15	Low-lying scrub-shrub wetland within maintained ROW and forested wetland outside maintained ROW associated with perennial stream.
Wetland 36	11	PSS		Ridgebury, Leicester, and Whitman soils, extremely stony (Hydric)	Poorly Drained	S16	Large low-lying scrub-shrub wetland within maintained ROW associated with perennial stream and located adjacent to existing improved access road.
				Walpole sandy loam (Hydric)	Poorly Drained		
				Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky	Well Drained		
				Hollis-Chatfield-Rock outcrop complex, 15 to 45 percent slopes	Somewhat Excessively Drained		
Wetland 37	11	PSS		Ridgebury, Leicester, and Whitman soils, extremely stony (Hydric)	Poorly Drained		Low-lying scrub-scrub wetland within maintained ROW adjacent to existing access road.
				Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky	Well Drained		
Wetland 38	11	PSS		Hollis-Chatfield-Rock outcrop complex, 15 to 45 percent slopes	Somewhat Excessively Drained		Isolated scrub-shrub wetland located within maintained ROW.
Wetland 39	12	PSS		Raypol silt loam (Hydric)	Poorly Drained	S17, S18	Scrub-shrub wetland within maintained ROW associated with floodplain of perennial streams and adjacent to Beaver Meadow Road.
				Walpole sandy loam (Hydric)	Poorly Drained		
				Merrimac sandy loam, 0 to 3 percent slopes	Somewhat Excessively Drained		
Wetland 40	12	PSS		Walpole sandy loam (Hydric)	Poorly Drained	S17	Scrub-shrub wetland within maintained ROW associated with floodplain of perennial stream.
				Merrimac sandy loam, 0 to 3 percent slopes	Somewhat Excessively Drained		

Table 1. Summary of Wetlands along the 1620/1975 Line Maintenance Project.

Wetland ID	Map Sheet	Wetland Type	Potential Vernal Pool	NRCS Mapped Soil Series	Drainage Class	Associated Watercourse	General Description
Wetland 41	12	PSS	X	Raypol silt loam (Hydric)	Poorly Drained		Scrub-shrub wetland located within maintained ROW and adjacent to Beaver Meadow Road.
Wetland 42	12	PSS/PEM PFO		Catden and Freetown soils (Hydric)	Very Poorly Drained		Low-lying scrub shrub wetland/emergent marsh complex located within maintained ROW and forested wetland outside maintained ROW.
				Hinckley gravelly sandy loam, 3 to 15 percent slopes	Excessively Drained		
				Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky	Well Drained		
Wetland 43	12, 13	PEM/PSS		Pootatuck fine sandy loam (Alluvial)	Moderately Well Drained	S19	Emergent marsh/scrub-shrub wetland complex associated with floodplain of perennial stream located within maintained ROW.
Wetland 44	13	PSS		Ridgebury, Leicester, and Whitman soils, extremely stony (Hydric)	Poorly Drained		Low-lying scrub-shrub wetland located within maintained ROW.
Wetland 45	13, 14	PSS		Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky	Well Drained		Low-lying scrub-shrub wetland located within maintained ROW adjacent to existing improved access road.
Wetland 46	13, 14	PSS/PEM		Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky	Well Drained		Isolated low-lying scrub-shrub wetland/emergent marsh complex located within maintained ROW.
Wetland 47	14	PSS		Ridgebury, Leicester, and Whitman soils, extremely stony (Hydric)	Poorly Drained	S20	Scrub-shrub wetland within maintained ROW associated with floodplain of perennial stream and adjacent to existing improved access road.
				Paxton and Montauk fine sandy loams, 3 to 15 percent slopes, extremely stony	Well Drained		
Wetland 48	14	PSS		Ridgebury, Leicester, and Whitman soils, extremely stony (Hydric)86C	Poorly Drained	S20	Scrub-shrub wetland within maintained ROW associated with floodplain of perennial stream and adjacent to existing improved access road.
Wetland 49	14	PSS		Ridgebury, Leicester, and Whitman soils, extremely stony (Hydric)	Poorly Drained	S21	Scrub-shrub wetland fringe adjacent to perennial stream within maintained ROW.

Table 1. Summary of Wetlands along the 1620/1975 Line Maintenance Project.

Wetland ID	Map Sheet	Wetland Type	Potential Vernal Pool	NRCS Mapped Soil Series	Drainage Class	Associated Watercourse	General Description
Wetland 50	14	PSS		Ridgebury, Leicester, and Whitman soils, extremely stony (Hydric)	Poorly Drained	S22	Scrub-shrub wetland associated with perennial stream within maintained ROW and adjacent to existing maintained access road.
				Woodbridge fine sandy loam, 2 to 15 percent slopes, extremely stony	Moderately Well Drained		
				Paxton and Montauk fine sandy loams, 3 to 15 percent slopes, extremely stony	Well Drained		
Wetland 51	14	PSS		Ridgebury, Leicester, and Whitman soils, extremely stony (Hydric)	Poorly Drained		Scrub-shrub wetland within maintained ROW and adjacent to existing maintained access road.
Wetland 52	14	PSS		Timakwa and Natchaug soils (Hydric)	Very Poorly Drained	S24	Low-lying scrub-shrub wetland associated with a perennial stream within maintained ROW and adjacent to existing maintained access road.
				Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky	Well Drained		
Wetland 53	14	PSS	X	Timakwa and Natchaug soils (Hydric)	Very Poorly Drained		Low-lying scrub-shrub wetland within maintained ROW and adjacent to existing improved access road.
				Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky	Well Drained		
Wetland 54	15	PSS/PEM	X	Timakwa and Natchaug soils (Hydric)	Muck Drained		Low-lying scrub-shrub wetland/emergent marsh complex within maintained ROW and adjacent to existing unimproved access road.
				Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky	Well Drained		
Wetland 55	15	PEM/PSS/ PFO		Ridgebury, Leicester, and Whitman soils, extremely stony (Hydric)	Poorly Drained	S25	Emergent marsh/scrub-shrub wetland complex fringe adjacent to intermittent stream within maintained ROW and forested wetland fringe outside maintained ROW.
				Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky	Well Drained		
Wetland 56	17	PSS/PFO		Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky	Well Drained	S27	Scrub-shrub wetland fringe adjacent to perennial stream within maintained ROW and forested wetland fringe outside maintained ROW.

Table 1. Summary of Wetlands along the 1620/1975 Line Maintenance Project.

Wetland ID	Map Sheet	Wetland Type	Potential Vernal Pool	NRCS Mapped Soil Series	Drainage Class	Associated Watercourse	General Description
Wetland 57	16	PEM/PSS		Ridgebury, Leicester, and Whitman soils, extremely stony (Hydric)	Poorly Drained	S26	Emergent marsh/scrub-shrub wetland complex associated with perennial stream located within a maintained ROW adjacent to Smith Hill Road.

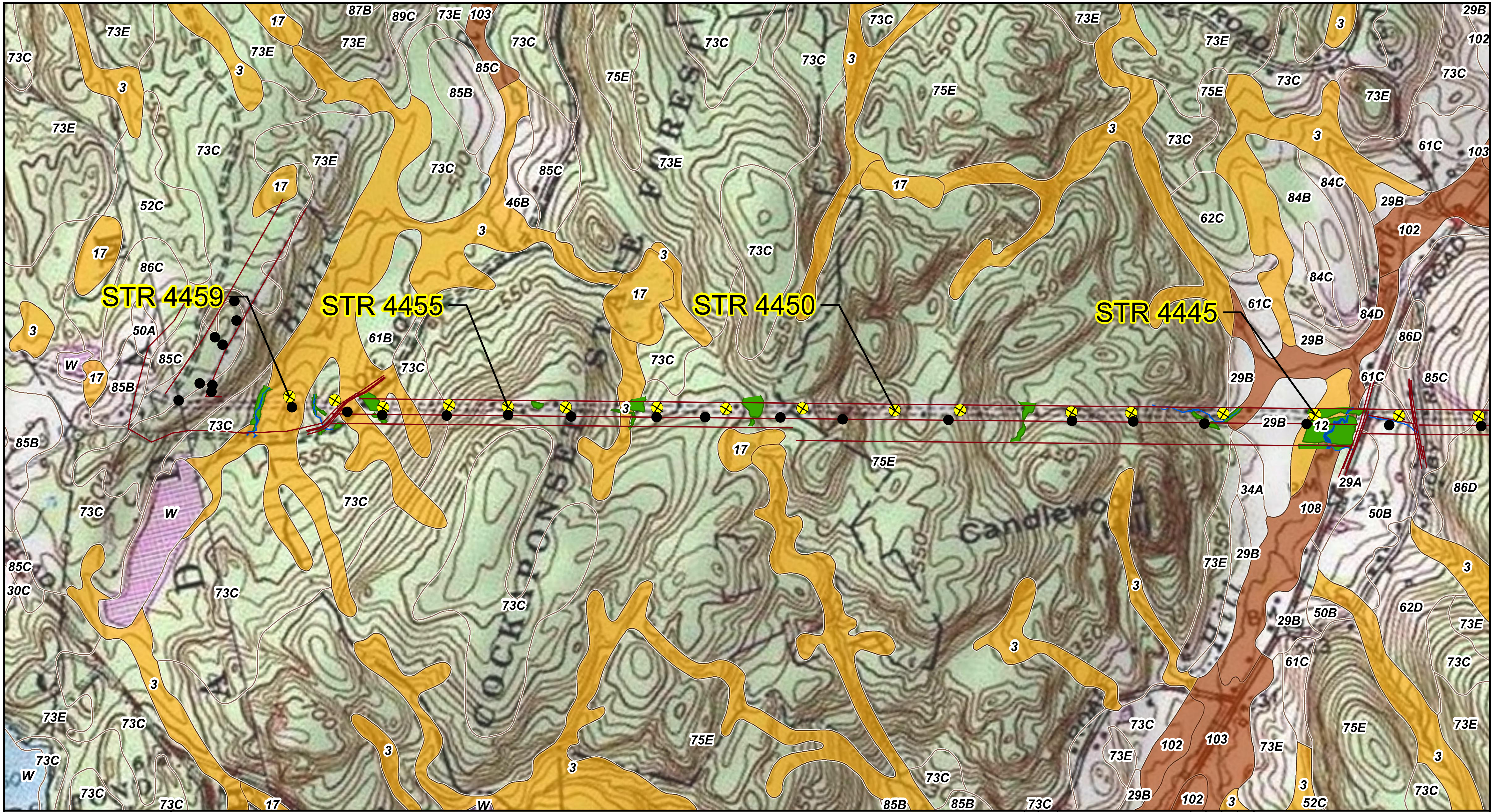
Table 2. Summary of Watercourses along the 1620/1975 Line Project.

Watercourse ID	Map Sheet	Watercourse Name	Flow Regime	CT DEEP Water Quality Designation	Associated Wetland
S1	1	Bible Rock Brook	Perennial	A	Wetland 1
S1-A	1	Unnamed Tributary to Bible Rock Brook	Intermittent	A	
S2	1	Unnamed Tributary to Bible Rock Brook	Perennial	A	Wetlands 2, 3, 4
S3	3	Unnamed Tributary to Candlewood Hill Brook	Perennial	A	Wetlands 13, 14
S3-A	3	Unnamed Tributary to Candlewood Hill Brook	Intermittent	A	
S4	4	Candlewood Hill Brook	Perennial	A	Wetlands 15, 16, 17
S4-A	4	Unnamed Tributary to Candlewood Hill Brook	Intermittent	A	Wetland 17
S5	4	Unnamed Tributary to Candlewood Hill Brook	Intermittent	A	
S6	4	Unnamed Tributary to Candlewood Hill Brook	Perennial	A	Wetland 18
S7	5	Unnamed Pond	Perennial	A	
S8	5	Unnamed Tributary to Candlewood Hill Brook	Perennial	A	
S9	5	Unnamed Tributary to Candlewood Hill Brook	Intermittent	A	
S10	5	Unnamed Tributary to Candlewood Hill Brook	Perennial	A	Wetlands 20, 21
S11	5, 6	Unnamed Tributary to Scovill Reservoir	Intermittent	A	Wetland 22
S12	7	Unnamed Tributary to Ponset Brook	Intermittent	A	
S13	7, 8	Unnamed Tributary to Ponset Brook	Intermittent	A	
S14	10	Unnamed Tributary to Pole Bridge Brook	Intermittent	A	Wetland 34
S15	10, 11	Unnamed Tributary to Pole Bridge Brook	Intermittent	A	Wetland 35
S16	11	Unnamed Tributary to Mill Creek	Perennial	A	Wetland 36
S17	12	Mill Creek	Perennial	A	Wetlands 39, 40
S18	12	Unnamed Tributary to Mill Creek	Intermittent	A	Wetland 39
S19	12	Turkey Hill Creek	Perennial	A	Wetland 43
S20	14	Unnamed Tributary to Mill Creek	Perennial	A	Wetlands 47, 48
S21	14	Unnamed Tributary to Mill Creek	Perennial	A	Wetland 49
S22	14	Unnamed Tributary to Mill Creek	Intermittent	A	Wetland 50
S23	14	Unnamed Tributary to Mill Creek	Intermittent	A	

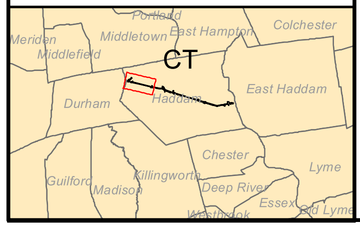
Table 2. Summary of Watercourses along the 1620/1975 Line Project.

Watercourse ID	Map Sheet	Watercourse Name	Flow Regime	CT DEEP Water Quality Designation	Associated Wetland
S24	14	Unnamed Tributary to Connecticut River	Intermittent	A	Wetland 52
S25	15	Unnamed Tributary to Rutty Creek	Intermittent	A	Wetland 55
S26	16	Rutty Creek	Perennial	A	Wetland 56
S27	17	Unnamed Pond/Tributary to Rutty Creek	Perennial	A	

Appendix B
Project Mapping



INDEX MAP



Legend

- ● Existing Structure to Remain
- ⊗ Existing Structure to be Replaced
- ROW Limits
- Poorly Drained and Very Poorly Drained Soils
- Alluvial and Floodplain Soils
- SSURGO Soil Map Unit
- Field Delineated Surface Water
- Field Delineated Wetland

N E S W

1 inch = 1,000 feet

0 500 1,000 Feet

NO.	DATE	REVISIONS	BY	CHK	APP	APP

EVERSOURCE

1620/1975 Lines Structure Replacement Project

Haddam, CT

Mapsheet 1 of 4

8/19/2016

AECOM

STR 4445

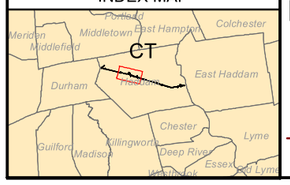
STR 4440

STR 4435

STR 4430

Scovill Reservoir

INDEX MAP



Legend

- Existing Structure to Remain
- Existing Structure to be Replaced
- ROW Limits
- Poorly Drained and Very Poorly Drained Soils
- Alluvial and Floodplain Soils
- SSURGO Soil Map Unit
- Field Delineated Surface Water
- Field Delineated Wetland

1 inch = 1,000 feet

0 500 1,000 Feet

NO.	DATE	REVISIONS	BY	CHK	APP	APP

EVERSOURCE

1620/1975 Lines Structure Replacement Project

Haddam, CT

Mapsheet 2 of 4

8/19/2016

AECOM

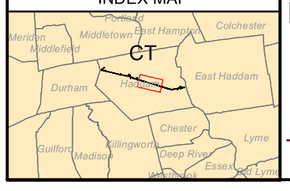
STR 4425

STR 4420

STR 4415

STR 4410

INDEX MAP



Legend

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1 inch = 1,000 feet

0 500 1,000 Feet

NO.	DATE	REVISIONS	BY	CHK	APP	APP

EVERSOURCE

1620/1975 Lines Structure Replacement Project

Haddam, CT

Mapsheet 3 of 4

8/19/2016

AECOM

STR 4410

STR-4405

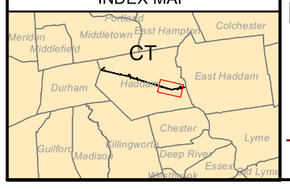
STR-4400

STR 4395

STR 4494

Cremation Hill

INDEX MAP



Legend

- Existing Structure to Remain
- Existing Structure to be Replaced
- ROW Limits
- Poorly Drained and Very Poorly Drained Soils
- Alluvial and Floodplain Soils
- SSURGO Soil Map Unit
- Field Delineated Surface Water
- Field Delineated Wetland

1 inch = 1,000 feet

0 500 1,000 Feet

NO.	DATE	REVISIONS	BY	CHK	APP	APP

EVERSOURCE

1620/1975 Lines Structure Replacement Project

Haddam, CT

Mapsheet 4 of 4

8/19/2016

AECOM

Appendix C
Photographic Documentation

AECOM

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Eversource	1620/1975 Line ROW, Haddam, CT	60505445

Photo No.	Date:
1	8/3/2016

Photo Direction:
West

Description:

Wetland 1
Associated with Watercourses S1 & S1A
PEM within maintained ROW
PFO outside maintained ROW

Photo No.	Date:
2	8/3/2016

Photo Direction:
South

Description:

Watercourse S1 (Bible Rock Brook)
Associated with PFO portion of W1

AECOM

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Eversource	1620/1975 Line ROW, Haddam, CT	60505445

Photo No.	Date:
3	1/20/2016

Photo Direction:
South

Description:

Wetland 2
Associated with
Watercourse S2
PSS within maintained
ROW

Photo No.	Date:
4	8/8/2016

Photo Direction:
South

Description:

Watercourse S2 (unnamed tributary to Bible Rock Brook)
Associated with Wetlands 2, 3, 4

AECOM

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Eversource	1620/1975 Line ROW, Haddam, CT	60505445

Photo No.	Date:
5	1/20/2016

Photo Direction:
South

Description:

Wetland 3
Associated with
Watercourse S2
PFO

Photo No.	Date:
6	1/21/2016

Photo Direction:
West

Description:

Wetland 5
PSS

AECOM

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Eversource	1620/1975 Line ROW, Haddam, CT	60505445

Photo No.	Date:
7	1/20/2016

Photo Direction:
East-Southeast

Description:

Wetland 6
PEM/PSS

Photo No.	Date:
8	8/3/2016

Photo Direction:
West

Description:

Wetland 7 (left side of access road)
PEM

AECOM

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Eversource	1620/1975 Line ROW, Haddam, CT	60505445

Photo No.	Date:
9	8/3/2016

Photo Direction:
East

Description:

Wetland 8 (left side of access road)
Wetland 9 (right side of access road)
PSS

Photo No.	Date:
10	1/21/2016

Photo Direction:
North

Description:

Wetland 10
PEM/PSS

AECOM

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Eversource	1620/1975 Line ROW, Haddam, CT	60505445

Photo No.	Date:
11	1/21/2016

Photo Direction:
South

Description:

Wetland 11
PSS

Photo No.	Date:
12	8/3/2016

Photo Direction:
West

Description:

Wetland 10 (right side of access road)
Wetland 11 (left side of access road)
PSS

AECOM

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Eversource	1620/1975 Line ROW, Haddam, CT	60505445

Photo No.	Date:
13	8/3/2016

Photo Direction:
Southwest

Description:

Wetland 12
PEM/PSS within maintained ROW
PFO outside maintained ROW

Photo No.	Date:
14	1/21/2016

Photo Direction:
West

Description:

Watercourse S3-A (unnamed tributary to Candlewood Hill Brook) Associated with Wetlands 13 and 14

AECOM

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Eversource	1620/1975 Line ROW, Haddam, CT	60505445

Photo No.	Date:
15	8/3/2016

Photo Direction:
West

Description:

Wetland 13
Associated with
Watercourse S3
PSS

Photo No.	Date:
16	8/3/2016

Photo Direction:
West

Description:

Wetland 15 (right side of access road)
Wetland 16 (left side of access road)
PEM/floodplain associated with Watercourse S4 (Candlewood Hill Brook)

AECOM

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Eversource	1620/1975 Line ROW, Haddam, CT	60505445

Photo No.	Date:
17	8/3/2016

Photo Direction:
West

Description:

Wetland 16 (right side of access road)
Wetland 17 (left side of access road)
PEM/floodplain associated
Watercourse S4 and S4-A.

Photo No.	Date:
18	8/4/2016

Photo Direction:
East

Description:

Watercourse S4-A (unnamed tributary to Candlewood Hill Brook) Associated with Watercourse S4 & Wetland 17

AECOM

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Eversource	1620/1975 Line ROW, Haddam, CT	60505445

Photo No.	Date:
19	8/3/2016

Photo Direction:
East

Description:

Watercourse S5 (unnamed tributary to Candlewood Hill Brook)

Photo No.	Date:
20	1/21/2016

Photo Direction:
East

Description:

Wetland 18
Associated with
Watercourse S6
PEM/PSS within
maintained ROW
PFO outside maintained
ROW

AECOM

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Eversource	1620/1975 Line ROW, Haddam, CT	60505445

Photo No.	Date:
21	8/4/2016

Photo Direction:
Southeast

Description:

Watercourse S6 (unnamed tributary to Candlewood Hill Brook)
Associated with Wetland 18

Photo No.	Date:
22	1/21/2016

Photo Direction:
Northwest

Description:

Wetland 19
PFO

AECOM

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Eversource	1620/1975 Line ROW, Haddam, CT	60505445

Photo No.	Date:
23	8/5/2016

Photo Direction:
Southeast

Description:

Watercourse S7 (unnamed pond)

Photo No.	Date:
24	8/5/2016

Photo Direction:
West

Description:

Watercourse S8 (unnamed tributary to Candlewood Hill Brook)

AECOM

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Eversource	1620/1975 Line ROW, Haddam, CT	60505445

Photo No.	Date:
25	8/5/2016

Photo Direction:
North

Description:

Watercourse S9 (unnamed tributary to Candlewood Hill Brook)

Photo No.	Date:
26	8/3/2016

Photo Direction:
Southeast

Description:

Wetland 20
Associated with right side of Watercourse S10
PSS

AECOM

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Eversource	1620/1975 Line ROW, Haddam, CT	60505445

Photo No.	Date:
27	8/5/2016

Photo Direction:
North

Description:

Watercourse S10 (unnamed tributary to Candlewood Hill Brook) Associated with Wetlands 20 and 21

Photo No.	Date:
28	8/3/2016

Photo Direction:
East

Description:

Wetland 21 Associated with Watercourse S10 PFO

AECOM

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Eversource	1620/1975 Line ROW, Haddam, CT	60505445

Photo No.	Date:
29	8/3/2016

Photo Direction:
East

Description:

Wetland 22
Associated with
Watercourse S11
PSS within maintained
ROW
PFO outside maintained
ROW

Photo No.	Date:
30	8/3/2016

Photo Direction:
South

Description:

Watercourse S11
(unnamed tributary to
Scovill Reservoir)
Associated with Wetland 22

AECOM

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Eversource	1620/1975 Line ROW, Haddam, CT	60505445

Photo No.	Date:
31	1/21/2016

Photo Direction:
Southwest

Description:

Wetland 25
PFO outside maintained ROW

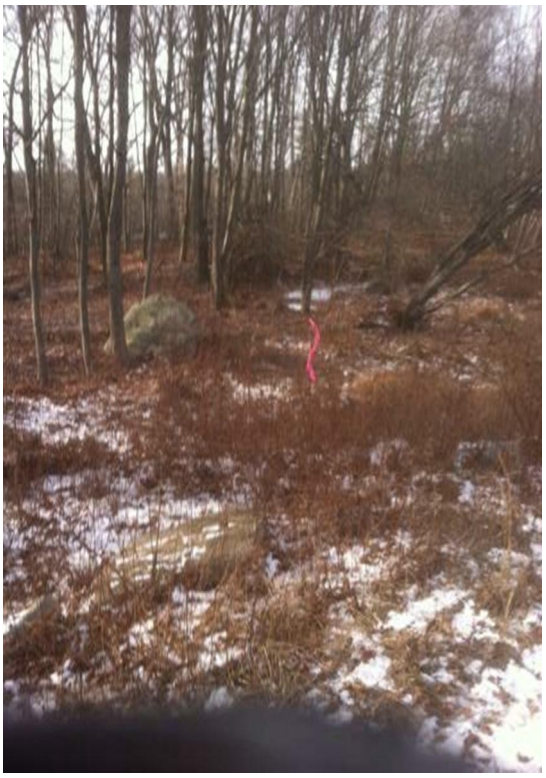


Photo No.	Date:
32	1/21/2016

Photo Direction:
Northwest

Description:

Wetland 26
PSS

AECOM

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Eversource	1620/1975 Line ROW, Haddam, CT	60505445

Photo No.	Date:
33	8/5/2016

Photo Direction:
East-southeast

Description:

Watercourse S12 (unnamed tributary to Ponset Brook)

Photo No.	Date:
34	8/5/2016

Photo Direction:
West

Description:

Watercourse S13 (unnamed tributary to Ponset Brook)

AECOM

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Eversource	1620/1975 Line ROW, Haddam, CT	60505445

Photo No.	Date:
35	5/18/2016

Photo Direction:
West

Description:

Wetland 27
PSS

Photo No.	Date:
36	5/18/2016

Photo Direction:
Southeast

Description:

Wetland 28
Potential Vernal Pool
PFO

AECOM

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Eversource	1620/1975 Line ROW, Haddam, CT	60505445

Photo No. 37 | **Date:** 5/17/2016

Photo Direction:
Northwest

Description:

Wetland 29
PSS

Photo No. 38 | **Date:** 5/17/2016

Photo Direction:
South

Description:

Wetland 30
PSS

AECOM

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Eversource	1620/1975 Line ROW, Haddam, CT	60505445

Photo No.	Date:
39	5/17/2016

Photo Direction:
South

Description:

Wetland 32
PSS

Photo No.	Date:
40	5/17/2016

Photo Direction:
South

Description:

Wetland 34
Associated with
Watercourse S14
PSS

AECOM

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Eversource	1620/1975 Line ROW, Haddam, CT	60505445

Photo No.	Date:
41	5/16/2016

Photo Direction:
North

Description:

Watercourse S14
(unnamed tributary to Pole Bridge Brook)
Associated with Wetland 34

Photo No.	Date:
42	5/17/2016

Photo Direction:
East

Description:

Wetland 35
Associated with Watercourse S15
PSS within maintained ROW
PFO outside maintained ROW

AECOM

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Eversource	1620/1975 Line ROW, Haddam, CT	60505445

Photo No.	Date:
43	5/16/2016

Photo Direction:
North

Description:

Watercourse S15
(unnamed tributary to Pole Bridge Brook)
Associated with Wetland 35

Photo No.	Date:
44	5/17/2016

Photo Direction:
Southeast

Description:

Wetland 36
Associated Watercourse S16
PSS

AECOM

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Eversource	1620/1975 Line ROW, Haddam, CT	60505445

Photo No.	Date:
45	5/16/2016

Photo Direction:
North

Description:

Watercourse 16 (unnamed tributary to Mill Creek)
Associated with Wetland 36

Photo No.	Date:
46	5/17/2016

Photo Direction:
North

Description:

Wetland 38
PSS

AECOM

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Eversource	1620/1975 Line ROW, Haddam, CT	60505445

Photo No.	Date:
47	5/17/2016

Photo Direction:
Northeast

Description:

Wetland 39
Associated with Watercourse S17 (Mill Creek, pictured) and Watercourse S18 (unnamed tributary to Mill Creek)
PSS

Photo No.	Date:
48	5/17/2016

Photo Direction:
South

Description:

Wetland 40
Associated with Watercourse S17 (Mill Creek, pictured)
PSS

AECOM

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Eversource	1620/1975 Line ROW, Haddam, CT	60505445

Photo No.	Date:
49	5/18/2016

Photo Direction:
West

Description:

Wetland 42
PSS/PEM

Photo No.	Date:
50	5/18/2016

Photo Direction:
West

Description:

Wetland 43
Associated with
Watercourse S19 (Turkey
Hill Brook)
PEM/PSS

AECOM

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Eversource	1620/1975 Line ROW, Haddam, CT	60505445

Photo No.	Date:
51	5/18/2016

Photo Direction:
East

Description:

Watercourse S19 (Turkey Hill Brook)
Associated with Wetland 43

Photo No.	Date:
52	5/18/2016

Photo Direction:
East

Description:

Wetland 44
PSS

AECOM

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Eversource	1620/1975 Line ROW, Haddam, CT	60505445

Photo No.	Date:
53	5/18/2016

Photo Direction:
North

Description:

Wetland 45
PSS

Photo No.	Date:
54	5/17/2016

Photo Direction:
East

Description:

Wetland 46
PSS

AECOM

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Eversource	1620/1975 Line ROW, Haddam, CT	60505445

Photo No.	Date:
55	8/8/2016

Photo Direction:
West

Description:

Wetland 47 (right side of access road)
Wetland 48 (left side of access road)
Associated with Watercourse S20 (unnamed tributary to Mill Creek)
PSS

Photo No.	Date:
56	5/17/2016

Photo Direction:
East

Description:

Wetland 50
Associated with Watercourses S21 and S22 (unnamed tributaries to Mill Creek)
PSS

AECOM

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Eversource	1620/1975 Line ROW, Haddam, CT	60505445

Photo No.	Date:
57	5/17/2016

Photo Direction:
West

Description:

Watercourse S22
(unnamed tributary to Mill Creek)
Associated with Wetland 50

Photo No.	Date:
58	5/18/2016

Photo Direction:
North

Description:

Watercourse S23

AECOM

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Eversource	1620/1975 Line ROW, Haddam, CT	60505445

Photo No.	Date:
59	5/16/2016

Photo Direction:
Northeast

Description:

Wetland 52
Associated with
Watercourse S24
(unnamed tributary to
Connecticut River)
PSS

Photo No.	Date:
60	5/16/2016

Photo Direction:
East

Description:

Wetland 54
PSS/PEM

AECOM

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Eversource	1620/1975 Line ROW, Haddam, CT	60505445

Photo No.	Date:
61	8/8/2016

Photo Direction:
Northeast

Description:

Wetland 55
Associated with
Watercourse S25
(unnamed tributary to Rutty
Creek)
PEM/PSS within
maintained ROW
PFO outside maintained
ROW

Photo No.	Date:
62	8/8/2016

Photo Direction:
Southeast

Description:

Wetland 56
Associated with
Watercourse S27
PSS within maintained
ROW
PFO outside maintained
ROW

AECOM

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Eversource	1620/1975 Line ROW, Haddam, CT	60505445

Photo No.	Date:
63	8/8/2016

Photo Direction:
Northwest

Description:

Watercourse S27
(unnamed pond)
Associated with Wetland 56

Photo No.	Date:
64	8/8/2016

Photo Direction:
Southeast

Description:

Watercourse S27
(unnamed tributary to Rutty Creek)
Associated with Wetland 56

AECOM

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Eversource	1620/1975 Line ROW, Haddam, CT	60505445

Photo No.	Date:
65	8/8/2016

Photo Direction:
West

Description:

Wetland 57
Associated with
Watercourse S26 (Rutty
Creek)
PSS

Photo No.	Date:
66	8/8/2016

Photo Direction:
West

Description:

Watercourse S26 (Rutty
Creek)
Associated with Wetland 57

AECOM
500 Enterprise Drive
Rocky Hill, CT 06067

860.263.5800 tel
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Technical Memorandum

To	Mark Pappalardo, Eversource Energy	Page 1
CC	Chris Newhall, AECOM	
Subject	1620/1975 Lines Structure Replacement Project Vernal Pool Survey	

From	Scott Egan, CPSS
Date	October 4, 2016

INTRODUCTION

The Connecticut Light and Power Company, doing business as Eversource Energy (Eversource), proposes to replace 64 structures along an approximate 8 mile section of its existing 115-kV 1620/1975 transmission lines right-of-way (ROW) from Oxbow Junction to Haddam Substation in the town of Haddam, Connecticut (the Project). This memorandum summarizes vernal pool and potential vernal pool habitats observed by AECOM biologists during wetland and watercourse field delineations conducted in May and August 2016 in support of Eversource's Petition for a Declaratory Ruling (Petition) filing to the Connecticut Siting Council for the Project.

VERNAL POOL DEFINITIONS

State and federal agencies, as well as private conservation organizations have developed slightly different definitions to describe vernal pools. The following summarizes the definitions used by Connecticut Department of Energy and Environmental Protection (CT DEEP), the U.S. Army Corps of Engineers (USACE) New England District, and the Metropolitan Conservation Alliance (Calhoun and Klemens 2002).

The CT DEEP (2011) defines vernal pools as "*small bodies of standing fresh water found throughout the spring that are 'usually temporary' and result from various combinations of snowmelt, precipitation and high water tables associated with the spring season*".

These depressions can be natural or man-made. In most years, these areas become completely dry, losing water through infiltration and evapotranspiration. Vernal pools vary in many aspects including appearance, water source, hydroperiod, water quality and surrounding habitats. Field investigations must coincide with the amphibian breeding and/or larval development time periods to determine if an area is functioning as a vernal pool.

In Connecticut, to meet the definition of a vernal pool, the following four criteria must be met:

- Contains water for approximately two months during the growing season;
- Occurs within a confined depression or basin that lacks a permanent outlet stream;
- Lacks any fish populations; and

- Dries out most years, usually by late summer.

The USACE's Programmatic General Permit (PGP) for the State of Connecticut (USACE 2016) defines vernal pools as: "*an often temporary body of water occurring in a shallow depression of natural or human origin that fills during spring rains and snow melt and typically dries up during summer months. Vernal pools support populations of species specially adapted to reproducing in these habitats. Such species may include wood frogs, mole salamanders (Ambystoma spp.), fairy shrimp, fingernail clams (Sphaeriidae), and other amphibians, reptiles and invertebrates. Vernal pools lack breeding populations of fish."* It is noted in the PGP that the USACE will determine on a case-by-case basis which vernal pools are within their jurisdiction and that all vernal pools are subject to the jurisdiction of the CT DEEP under Connecticut Water Quality Standards.

Calhoun and Klemens (2002) *Best Development Practices*: *Conserving pool-breeding amphibians in residential and commercial developments in the northeastern United States* (BDP Manual) provides the following operational definition of vernal pools:

> *Vernal pools are seasonal bodies of water that attain maximum depths in the spring or fall, and lack permanent surface water connections with other wetlands or water bodies. Pools fill with snowmelt or runoff in the spring, although some may be fed primarily by groundwater sources. The duration of surface flooding, known as hydroperiod, varies depending upon the pool and the year; vernal pool hydroperiods range along a continuum from less than 30 days to more than one year. Pools are generally small in size (<2 acres), with the extent of vegetation varying widely. They lack established fish populations, usually as a result of periodic drying, and support communities dominated by animals adapted to living in temporary, fishless pools. In the region, they provide essential breeding habitat for one or more wildlife species including Ambystomid salamanders* (Ambystoma spp.*, called "mole salamanders" because they live in burrows*)*, wood frogs* (Rana sylvatica)*, and fairy shrimp* (Eubranchipus spp)*.*

Calhoun and Klemens (2002) go on further to define adjacent habitats as the "Vernal Pool Envelope" (area within 100 feet of the pool's edge) and the "Critical Terrestrial Habitat" (area within 100-750 feet of the pool's edge) because avoiding and minimizing impacts to these areas are necessary to protect the functionality and integrity of the pool itself, and to protect the individuals residing within or passing through (i.e., during immigration and emigration from the vernal pool) these areas.

Many organisms rely upon vernal pool habitat for reproductive success. These species are referred to as obligate or indicator vernal pool species. Obligate or indicator species that may have ranges within the Project area include the following:

- Wood frog (*Lithobates sylvatica*)
- Eastern spadefoot toad (*Scaphiopus holbrookii*)
- Spotted salamander (*Ambystoma maculatum*)
- Jefferson salamander (*Ambystoma jeffersonianum*)
- Marbled salamander (*Ambystoma opacum*)
- Fairy shrimp (*Branchiopoda anostraca*)

Facultative or secondary vernal pool species are fauna that utilize, but do not necessarily require, vernal pools for reproductive success. Examples of facultative species include spring peeper (*Pseudacris crucifer*), American toad (*Anaxurus americanus*), gray treefrog (*Hyla versicolor*) and spotted turtle (*Clemmys guttata*). Facultative or secondary species such as these can utilize vernal

pool habitats; however, they can also breed successfully in the margins of permanent water bodies including streams, rivers, ponds and lakes.

VERNAL POOL SURVEYS

Vernal pool observations were made by AECOM biologists during wetland and watercourse inventories and field delineations conducted in May and August 2016. All field delineated wetlands were evaluated for vernal pool habitat including both physical and biological characteristics. A total of six potential vernal pools were identified; five in May, and one additional pool located outside of the existing ROW was observed in August. Each of these pools is described below starting from the western end of the project. See "1620/1975 Lines Structure Replacement Project Maps" (Figures 2, 9, 12, 14, and 15 of 17) included with the Petition filing for depiction of pool locations.

Potential vernal pool #1 (PVP 1) is associated with Wetland #10 (Figure 2 of 17). The pool is a deeper depression within a larger palustrine forested wetland system and is located just north of the existing ROW. This pool has a partially open canopy and is dominated by buttonbush (*Cephalanthus occidentalis*) throughout the central portion indicating an extended hydroperiod. This depression was observed in August and is therefore classified as a potential vernal pool.

Potential Vernal Pool #2 (PVP 2) is associated within Wetland #28 (Figure 9 of 17) and is also associated with a larger palustrine forested wetland. Dominant vegetation includes red maple (*Acer rubrum*), sweet pepperbush (*Clethra alnifolia*), and skunk cabbage (*Symplocarpus foetidus*), and water depths ranged up to approximately 3 feet deep. The water was a dark/tannic color and no egg masses were observed from the pond edge. However, based on the depth of ponding, it does appear to have the appropriate hydroperiod to support amphibian breeding and is therefore classified as a potential vernal pool.

Potential Vernal Pool #3 (PVP 3) is associated with Wetlands #29 (Figure 9 of 17) and is located within a long and narrow (approximately 84 feet long by 11 feet wide) historic access road through a palustrine scrub-shrub/emergent wetland. Water within this pool was up to two feet deep in some locations and contained spotted salamander egg masses, wood frog tadpoles and American toad tadpoles. Dominant vegetation includes tussock sedge (*Carex stricta*), sphagnum moss (*Sphagnum spp*.), meadowsweet (*Spirea latifolia*) and maleberry (*Lyonia ligustrina*). Although this pool was created through human disturbance, it does appear to contain the hydroperiod and aquatic fauna necessary to function as vernal pool habitat.

Potential Vernal Pool #4 (PVP 4) is associated with Wetland #41 (Figure 12 of 17) and is part of a larger palustrine forested wetland. The pool is located south of the existing ROW and directly adjacent to Beaver Meadow Road. It is a small circular, manmade pool approximately 16 feet in diameter, with an intermittent outlet into intermittent stream S18. The pool has a closed canopy of red maple and is greater than three feet deep. A total of 14 spotted salamander egg masses were counted, attached to fine woody debris within the pool however, the pool was choked with leaf litter at the time of inspection and may have contained more or additional species. This pool appears to have the physical and biological characteristics necessary to classify it as a vernal pool.

Potential Vernal Pool #5 (PVP 5) is associated with Wetland #53 (Figure 14 of 17) and is part of a larger palustrine forested wetland. The pool is located on the south side of the ROW adjacent to an existing access road. This wetland has prominent pit and mound topography with pit areas likely deep enough to provide vernal pool breeding habitat. Dominant vegetation includes red maple, black gum (*Nyssa sylvatica*), highbush blueberry (*Vaccinium corymbosum*), spicebush (*Lindera benzoin*), and skunk cabbage. Approximately 25 spotted salamander egg masses were observed

within this wetland attached to fine woody debris. This pool appears to have the physical and biological characteristics necessary to classify it as a vernal pool.

Potential Vernal Pool #6 (PVP 6) is associated with Wetland #54 (Figure 15 of 17) and is very similar in physical characteristics (i.e., extensive pit and mound topography) and plant community to Wetland #53, but is separated by a broad till ridge of open hardwoods. Dominant vegetation includes red maple, highbush blueberry, spicebush and skunk cabbage. No egg masses or larvae of vernal pool indicator species was observed in this wetland in ponded areas directly adjacent to the existing access road, however this habitat extends far to the south of the existing ROW and may provide breeding habitat in other portions of this wetland, and is therefore identified as a potential vernal pool.

RECOMMENDED BEST MANAGEMENT PRACTICES

The following measures will be taken to avoid or minimize impacts on the above-referenced potential vernal pools during construction:

1. During construction, access through the potential vernal pools will be avoided.
2. No new access roads or construction work pads are proposed to be constructed within the vernal pool envelope (0-100 feet) of the potential vernal pools.
3. Existing scrub-shrub vegetation within the envelope to the potential vernal pools will be maintained, consistent with ROW vegetation management requirements. If low growing (scrub-shrub) vegetation must be removed adjacent to the potential vernal pools, the cut vegetation (slash) will be left in place to serve as recruitment for leaf litter and coarse woody debris.
4. Erosion and sedimentation controls will be installed and maintained along the adjacent existing access roads and around the adjacent work pads as necessary to protect water quality and to limit the potential for soil deposition into the potential vernal pools. Erosion control measures should be designed in a manner that allows unencumbered amphibian access to the potential vernal pool. Such measures may include, but not be limited to, syncopated silt fencing and/or straw wattles that do not have plastic mesh netting capable of entrapping wildlife, and aligning erosion and sedimentation controls to avoid bifurcating potential vernal pool habitat.
5. Plastic netting, which may be found in a variety of erosion control products (e.g., erosion control blankets, straw wattles, and reinforced silt fence), will not be used. Erosion and sedimentation control devices will be promptly removed upon final revegetation and stabilization of the ROW.

Sincerely yours,

Scott Egan, MS, CPSS
Wetland and Wildlife Ecologist
Scott.Egan@aecom.com

Attachment (Photographic Log)

REFERENCES

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

Connecticut Department of Energy and Environmental Protection (CTDEEP). 2011. Vernal Pools. Accessed March 8, 2011. Available URL: http://www.ct.gov/dep/cwp/view.asp?a=2720&q=325676&depNav_GID=1654

Department of the Army. 2016. Department of the Army General Permits for the State of Connecticut and Land Located Within the Boundaries of an Indian Reservation. Effective date: August 19, 2016; Expiration date: August 19, 2021. U.S. Army Corps of Engineers, New England District. Concord, Massachusetts.

AECOM

PHOTOGRAPHIC LOG

Client Name: Eversource Energy	Site Location: 1620/1975 Lines ROW, Haddam, CT	Project No. 60518816

Photo No. 1	Date: 8/3/2016

Description:

Vernal Pool #1, located within Wetland #10. View looking south towards existing ROW.

Photo No. 2	Date: 5/18/2016

Description:

Vernal Pool #2, located within Wetland #28. View looking southwest from existing access road down ROW.

AECOM

PHOTOGRAPHIC LOG

Client Name: Eversource Energy	Site Location: 1620/1975 Lines ROW, Haddam, CT	Project No. 60518816

Photo No. 3	Date: 5/18/2016

Description:

Vernal Pool #3, located within Wetland #29. View looking east towards existing ROW.

Photo No. 4	Date: 5/19/2016

Description:

Vernal Pool #4, located within Wetland #41. View looking east from Beaver Meadow Road.

AECOM

PHOTOGRAPHIC LOG

Client Name: Eversource Energy	Site Location: 1620/1975 Lines ROW, Haddam, CT	Project No. 60518816

Photo No. 5 | **Date:** 5/16/2016

Description:

Vernal Pool #5, located within Wetland #53. View looking east

Photo No. 6 | **Date:** 5/16/2016

Description:

Vernal Pool #5, located within Wetland #54. View looking south.

Attachment D
Vernal Pool Survey Technical Memorandum

AECOM
500 Enterprise Drive
Rocky Hill, CT 06067

860.263.5800 tel
860.263.5777 fax

Technical Memorandum

To	Mark Pappalardo, Eversource Energy	Page 1
CC	Chris Newhall, AECOM	
Subject	1620/1975 Lines Structure Replacement Project Vernal Pool Survey	

From	Scott Egan, CPSS
Date	October 4, 2016

INTRODUCTION

The Connecticut Light and Power Company, doing business as Eversource Energy (Eversource), proposes to replace 64 structures along an approximate 8 mile section of its existing 115-kV 1620/1975 transmission lines right-of-way (ROW) from Oxbow Junction to Haddam Substation in the town of Haddam, Connecticut (the Project). This memorandum summarizes vernal pool and potential vernal pool habitats observed by AECOM biologists during wetland and watercourse field delineations conducted in May and August 2016 in support of Eversource's Petition for a Declaratory Ruling (Petition) filing to the Connecticut Siting Council for the Project.

VERNAL POOL DEFINITIONS

State and federal agencies, as well as private conservation organizations have developed slightly different definitions to describe vernal pools. The following summarizes the definitions used by Connecticut Department of Energy and Environmental Protection (CT DEEP), the U.S. Army Corps of Engineers (USACE) New England District, and the Metropolitan Conservation Alliance (Calhoun and Klemens 2002).

The CT DEEP (2011) defines vernal pools as "*small bodies of standing fresh water found throughout the spring that are 'usually temporary' and result from various combinations of snowmelt, precipitation and high water tables associated with the spring season*".

These depressions can be natural or man-made. In most years, these areas become completely dry, losing water through infiltration and evapotranspiration. Vernal pools vary in many aspects including appearance, water source, hydroperiod, water quality and surrounding habitats. Field investigations must coincide with the amphibian breeding and/or larval development time periods to determine if an area is functioning as a vernal pool.

In Connecticut, to meet the definition of a vernal pool, the following four criteria must be met:

- Contains water for approximately two months during the growing season;
- Occurs within a confined depression or basin that lacks a permanent outlet stream;
- Lacks any fish populations; and

- Dries out most years, usually by late summer.

The USACE's Programmatic General Permit (PGP) for the State of Connecticut (USACE 2016) defines vernal pools as: "*an often temporary body of water occurring in a shallow depression of natural or human origin that fills during spring rains and snow melt and typically dries up during summer months. Vernal pools support populations of species specially adapted to reproducing in these habitats. Such species may include wood frogs, mole salamanders (Ambystoma spp.), fairy shrimp, fingernail clams (Sphaeriidae), and other amphibians, reptiles and invertebrates. Vernal pools lack breeding populations of fish."* It is noted in the PGP that the USACE will determine on a case-by-case basis which vernal pools are within their jurisdiction and that all vernal pools are subject to the jurisdiction of the CT DEEP under Connecticut Water Quality Standards.

Calhoun and Klemens (2002) *Best Development Practices*: *Conserving pool-breeding amphibians in residential and commercial developments in the northeastern United States* (BDP Manual) provides the following operational definition of vernal pools:

> *Vernal pools are seasonal bodies of water that attain maximum depths in the spring or fall, and lack permanent surface water connections with other wetlands or water bodies. Pools fill with snowmelt or runoff in the spring, although some may be fed primarily by groundwater sources. The duration of surface flooding, known as hydroperiod, varies depending upon the pool and the year; vernal pool hydroperiods range along a continuum from less than 30 days to more than one year. Pools are generally small in size (<2 acres), with the extent of vegetation varying widely. They lack established fish populations, usually as a result of periodic drying, and support communities dominated by animals adapted to living in temporary, fishless pools. In the region, they provide essential breeding habitat for one or more wildlife species including Ambystomid salamanders* (Ambystoma spp.*, called "mole salamanders" because they live in burrows*)*, wood frogs* (Rana sylvatica)*, and fairy shrimp* (Eubranchipus spp)*.*

Calhoun and Klemens (2002) go on further to define adjacent habitats as the "Vernal Pool Envelope" (area within 100 feet of the pool's edge) and the "Critical Terrestrial Habitat" (area within 100-750 feet of the pool's edge) because avoiding and minimizing impacts to these areas are necessary to protect the functionality and integrity of the pool itself, and to protect the individuals residing within or passing through (i.e., during immigration and emigration from the vernal pool) these areas.

Many organisms rely upon vernal pool habitat for reproductive success. These species are referred to as obligate or indicator vernal pool species. Obligate or indicator species that may have ranges within the Project area include the following:

- Wood frog (*Lithobates sylvatica*)
- Eastern spadefoot toad (*Scaphiopus holbrookii*)
- Spotted salamander (*Ambystoma maculatum*)
- Jefferson salamander (*Ambystoma jeffersonianum*)
- Marbled salamander (*Ambystoma opacum*)
- Fairy shrimp (*Branchiopoda anostraca*)

Facultative or secondary vernal pool species are fauna that utilize, but do not necessarily require, vernal pools for reproductive success. Examples of facultative species include spring peeper (*Pseudacris crucifer*), American toad (*Anaxurus americanus*), gray treefrog (*Hyla versicolor*) and spotted turtle (*Clemmys guttata*). Facultative or secondary species such as these can utilize vernal

pool habitats; however, they can also breed successfully in the margins of permanent water bodies including streams, rivers, ponds and lakes.

VERNAL POOL SURVEYS

Vernal pool observations were made by AECOM biologists during wetland and watercourse inventories and field delineations conducted in May and August 2016. All field delineated wetlands were evaluated for vernal pool habitat including both physical and biological characteristics. A total of six potential vernal pools were identified; five in May, and one additional pool located outside of the existing ROW was observed in August. Each of these pools is described below starting from the western end of the project. See "1620/1975 Lines Structure Replacement Project Maps" (Figures 2, 9, 12, 14, and 15 of 17) included with the Petition filing for depiction of pool locations.

Potential vernal pool #1 (PVP 1) is associated with Wetland #10 (Figure 2 of 17). The pool is a deeper depression within a larger palustrine forested wetland system and is located just north of the existing ROW. This pool has a partially open canopy and is dominated by buttonbush (*Cephalanthus occidentalis*) throughout the central portion indicating an extended hydroperiod. This depression was observed in August and is therefore classified as a potential vernal pool.

Potential Vernal Pool #2 (PVP 2) is associated within Wetland #28 (Figure 9 of 17) and is also associated with a larger palustrine forested wetland. Dominant vegetation includes red maple (*Acer rubrum*), sweet pepperbush (*Clethra alnifolia*), and skunk cabbage (*Symplocarpus foetidus*), and water depths ranged up to approximately 3 feet deep. The water was a dark/tannic color and no egg masses were observed from the pond edge. However, based on the depth of ponding, it does appear to have the appropriate hydroperiod to support amphibian breeding and is therefore classified as a potential vernal pool.

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Potential Vernal Pool #4 (PVP 4) is associated with Wetland #41 (Figure 12 of 17) and is part of a larger palustrine forested wetland. The pool is located south of the existing ROW and directly adjacent to Beaver Meadow Road. It is a small circular, manmade pool approximately 16 feet in diameter, with an intermittent outlet into intermittent stream S18. The pool has a closed canopy of red maple and is greater than three feet deep. A total of 14 spotted salamander egg masses were counted, attached to fine woody debris within the pool however, the pool was choked with leaf litter at the time of inspection and may have contained more or additional species. This pool appears to have the physical and biological characteristics necessary to classify it as a vernal pool.

Potential Vernal Pool #5 (PVP 5) is associated with Wetland #53 (Figure 14 of 17) and is part of a larger palustrine forested wetland. The pool is located on the south side of the ROW adjacent to an existing access road. This wetland has prominent pit and mound topography with pit areas likely deep enough to provide vernal pool breeding habitat. Dominant vegetation includes red maple, black gum (*Nyssa sylvatica*), highbush blueberry (*Vaccinium corymbosum*), spicebush (*Lindera benzoin*), and skunk cabbage. Approximately 25 spotted salamander egg masses were observed

within this wetland attached to fine woody debris. This pool appears to have the physical and biological characteristics necessary to classify it as a vernal pool.

Potential Vernal Pool #6 (PVP 6) is associated with Wetland #54 (Figure 15 of 17) and is very similar in physical characteristics (i.e., extensive pit and mound topography) and plant community to Wetland #53, but is separated by a broad till ridge of open hardwoods. Dominant vegetation includes red maple, highbush blueberry, spicebush and skunk cabbage. No egg masses or larvae of vernal pool indicator species was observed in this wetland in ponded areas directly adjacent to the existing access road, however this habitat extends far to the south of the existing ROW and may provide breeding habitat in other portions of this wetland, and is therefore identified as a potential vernal pool.

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5. Plastic netting, which may be found in a variety of erosion control products (e.g., erosion control blankets, straw wattles, and reinforced silt fence), will not be used. Erosion and sedimentation control devices will be promptly removed upon final revegetation and stabilization of the ROW.

Sincerely yours,

Scott Egan, MS, CPSS
Wetland and Wildlife Ecologist
Scott.Egan@aecom.com

Attachment (Photographic Log)

REFERENCES

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

Connecticut Department of Energy and Environmental Protection (CTDEEP). 2011. Vernal Pools. Accessed March 8, 2011. Available URL: http://www.ct.gov/dep/cwp/view.asp?a=2720&q=325676&depNav_GID=1654

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AECOM

PHOTOGRAPHIC LOG

Client Name: Eversource Energy	Site Location: 1620/1975 Lines ROW, Haddam, CT	Project No. 60518816

Photo No. 1	Date: 8/3/2016

Description:

Vernal Pool #1, located within Wetland #10. View looking south towards existing ROW.

Photo No. 2	Date: 5/18/2016

Description:

Vernal Pool #2, located within Wetland #28. View looking southwest from existing access road down ROW.

AECOM

PHOTOGRAPHIC LOG

Client Name: Eversource Energy	Site Location: 1620/1975 Lines ROW, Haddam, CT	Project No. 60518816

Photo No. 3	Date: 5/18/2016

Description:

Vernal Pool #3, located within Wetland #29. View looking east towards existing ROW.

Photo No. 4	Date: 5/19/2016

Description:

Vernal Pool #4, located within Wetland #41. View looking east from Beaver Meadow Road.

AECOM

PHOTOGRAPHIC LOG

Client Name: Eversource Energy	Site Location: 1620/1975 Lines ROW, Haddam, CT	Project No. 60518816

Photo No. 5 | **Date:** 5/16/2016

Description:

Vernal Pool #5, located within Wetland #53. View looking east

Photo No. 6 | **Date:** 5/16/2016

Description:

Vernal Pool #5, located within Wetland #54. View looking south.

Attachment E
Letter to the Abutters, Abutters List and Affidavit

EVERSOURCE ENERGY

56 Prospect Street
Hartford, CT 06103

October 13, 2016

Dear Neighbor,

As part of its everyday effort to deliver reliable energy and superior customer service to its customers, Eversource Energy ("Eversource") is submitting a petition to the Connecticut Siting Council ("CSC") for a proposed transmission upgrade project in your area.

The upgrade, called the 1620 and 1975 Line Project ("Project"), is necessary due to the condition of the existing transmission structures supporting these existing lines. These structure replacements are critical to ensure the continued reliability of the transmission line and the integrity of the transmission system.

The Project will be located entirely within existing rights-of way between Oxbow Road and Haddam Substation on Saybrook Road in Haddam. The Project includes replacing the existing laminate structures with weathering steel structures. The new structures will be approximately 2 to 16 feet taller than the existing structures. Pending CSC approval of the proposed structure replacement, construction is expected to begin in the fourth quarter of 2016 and restoration of any affected areas is anticipated by spring 2017.

Due to the current condition of the structures, it is necessary that arm replacements be conducted on some of the structures. This emergency arm replacement work will continue until the structures can be replaced through the proposed 1620 and 1975 Line Project.

For more information please call 1.800.793.2202 or send an email to TransmissionInfo@eversource.com.

If you would like to send comments regarding Eversource's petition to the CSC, please send them via email to siting.council@ct.gov or a letter to the following address:

Melanie Bachman, Acting Executive Director
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

Thank you.

Sincerely,

Brian Ragozzine

Brian Ragozzine
Eversource Project Manager

AFFIDAVIT OF SERVICE OF NOTICE

STATE OF CONNECTICUT)
) ss. Berlin
COUNTY OF HARTFORD)

Sec. 16-50j-40 of the Regulations of Connecticut State Agencies ("RCSA") provides that proof of notice to the affected municipalities, property owners and abutters shall be submitted with a petition for declaratory ruling to the Connecticut Siting Council ("Council"). In accordance with that RCSA section, I hereby certify that I caused notice of proposed modifications of The Connecticut Light and Power Company doing business as Eversource Energy to be served by mail or courier upon the following municipal officials:

Municipal Official:

The Honorable Lizz Milardo
First Selectman
Haddam Town Office Building
30 Field Park Drive
Haddam, CT 06438

I also certify that I caused notice of the proposed modifications to be served by mail or courier upon 65 owners of abutting properties shown on the maps in Attachment to the Petition.

Brian J. Ragozzine
Project Manager

On this the 14 day of October, 2016, before me, the undersigned representative, personally appeared, Brian J. Ragozzine, known to me (or satisfactorily proven) to be the person whose name is subscribed to the foregoing instrument and acknowledged that she executed the same for the purposes therein contained.

In witness whereof, I hereunto set my hand and official seal.

FLAVIA DIANA BIRD
Notary Public
Connecticut
My Commission Expires Aug 31 2[illegible]

Notary Public
My Commission expires: