MUNICIPAL CONSULTATION FILING

for the

OLD TOWN SUBSTATION REBUILD PROJECT

City of Bridgeport, Fairfield County, Connecticut

January 2020

Submitted to:

Chief Elected Officials of the City of Bridgeport and Town of Trumbull

Prepared By:

THE UNITED ILLUMINATING COMPANY

Provided in accordance the pre-application process (Connecticut General Statutes Section 16-50l(e)) for filing an Application to the Connecticut Siting Council for a Certificate of Environmental Compatibility and Public Need for an Electric Substation Facility.

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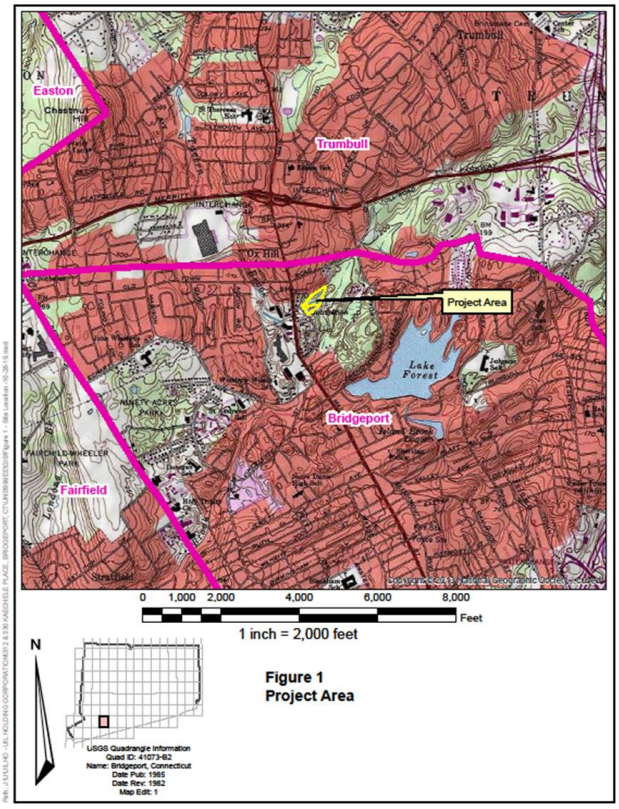
Figure 1: Project Area



Proposed Project: To improve the bulk electric system in Connecticut, and particularly in the Greater Bridgeport Region, The United Illuminating Company (UI or the Company) proposes to rebuild its existing Old Town Substation, located in the City of Bridgeport, Fairfield County, Connecticut. The existing Old Town Substation is a 115/13.8-kilovolt (kV) air-insulated substation (AIS) transmission and distribution facility that is located on a 0.9-acre parcel of UI-owned land at 280 Kaechele Place in northwest Bridgeport (refer to Figure 1). The station is more than 50 years old and provides electric service to the Greater Bridgeport area. Three overhead 115-kV transmission lines owned by The Connecticut Light and Power Company d/b/a Eversource Energy (Eversource) occupy a right-of-way (ROW) that extends through the existing substation site; two of the 115-kV lines connect to the existing substation. At the substation, these transmission lines are supported on approximately 105-foot-tall lattice steel structures.

After conducting studies to review current and future electric supply needs and to assess the physical condition of the substation equipment and infrastructure, UI determined that the existing Old Town Substation does not conform to Company and industry system performance standards for maintaining adequate, safe, and reliable service. As a result, UI determined that the substation must be replaced.

The Old Town Substation Rebuild Project (the Project) will entail the construction and operation of a new 115/13.8-kV transmission and distribution substation, proposed to be built on presently undeveloped, UI-owned property adjacent to the existing substation at 312 and 330 Kaechele Place (the Project site; see Figure 1). The undeveloped property, which is characterized by upland forest, shrub vegetation, and a wetland, totals approximately 3 acres.

Overall, the new substation will occupy approximately 2.25 acres, including all of the existing 0.9-acre substation parcel and approximately 1.35 acres of the adjacent 3-acre parcel. The remainder of the 3-acre parcel (i.e., approximately 1.63 acres) is not expected to be developed (refer to Figure 2). In addition, the Project will include minor modifications to link the new substation to the 115-kV transmission and distribution lines that presently connect to the existing Old Town Substation, including a new approximately 0.15-acre easement on City of Bridgeport property for the line

connections to the new substation. After the new substation is placed into service, the existing Old Town Substation will be decommissioned.

Figure 2: Project Site (Refer to larger view of this figure at the end of this section)

Need for the Project: The existing Old Town facility is more than 50 years old, and most of the substation's equipment must be replaced now or in the near future to meet industry and UI standards. The proposed Project is needed for UI to continue to provide reliable electric service to the Greater Bridgeport region, meeting both existing and future demands for electricity and conforming to industry and UI standards.

Proposed Project Facilities: The proposed Old Town Substation will consist of new facilities to directly replace and upgrade all the existing 115-kV and 13.8-kV components at the existing station. The new AIS substation will be designed as a two-transmission line, single-breaker arrangement, expandable to a two-bay breaker and one-half arrangement, with two 45/60/75 MVA, 115/13.8-kV power transformers with a plan for a future third transformer, as well as a future 115-kV capacitor bank. The substation will include new 115-kV and 13.8-kV switchyard equipment, a new control enclosure and a 13.8-kV switchgear enclosure, as well as modifications to the 115-kV overhead transmission lines and optical ground wire fiber optic cables.

A perimeter chain link fence with privacy slats, approximately 14 feet tall and topped with an additional 1 foot of barbed wire, will be installed around the new substation. In addition, to accommodate the existing site topography and minimize grading to the extent practical, a concrete retaining wall will be built around portions of the perimeter of the substation. The chain link fencing will be installed on top of the retaining wall.

The Project will not affect the alignment of Eversource's existing ROW through UI's property. However, the two Eversource transmission lines that presently connect to the existing Old Town Substation will be modified and rerouted slightly to connect to line terminals at the new substation. A third transmission line (which presently bypasses the existing substation) will be re-routed through the new substation yard as a provision for a future connection.

In total, nine new steel monopoles will be installed. Specifically, each of the two lattice towers will be replaced with two monopoles; these four monopoles will be located on the Eversource ROW: two within the substation and two on the ROW immediately to the east of the substation. The five remaining new monopoles, all within the substation boundaries, will support the existing and future 115-kV line connections to the new substation. The transmission line modifications will be coordinated with Eversource.

Figure 3 illustrates the proposed layout of the new substation, including the transmission line connections.

Figure 3: Proposed Substation Layout and Transmission Line Connections (Refer to larger view of this figure at the end of this section)

The cost of the proposed Project is estimated to be approximately $40 million. The substation equipment, transmission lines, and supporting infrastructure are expected to have a service life of about 40 years.

Construction Activities, Schedule, and Work Hours: The Project will require approximately 18 to 24 months to construct. Standard work hours will be 7:00 AM to 7:00 PM, Monday through Saturday; however, some construction tasks will require work on Sundays or beyond these standard daily work hours.

To construct the new substation, site preparation work will be required, including vegetation removal, grading, and filling. Blasting could be required, depending on the depth and type of bedrock encountered. To minimize the amount of grading, UI will construct a concrete retaining wall, approximately 700 feet in length and ranging in height from approximately 2 to 10 feet, depending on cut and fill requirements, around portions of the substation perimeter.

Other typical substation construction activities will include foundation, enclosure, and equipment installation; 115-kV and distribution line connections; testing, commissioning, and restoration. The construction activities required to realign the existing 115-kV overhead transmission lines to connect to the new substation will involve vegetation clearing, foundation excavation, structure and conductor installation and ROW restoration. After the installation of the new facilities, the old substation equipment will be decommissioned, and the two existing lattice transmission structures will be removed.

All primary construction activities are expected to be confined to UI property or to the existing Eversource 115-kV transmission line ROW in the immediate vicinity of the substation. However, UI anticipates that an approximately 0.15-acre easement from the City of Bridgeport (on property within the city's undeveloped Elton Rogers Woodland Park) will be required to accommodate the overhead lines extending into the new substation from the Eversource ROW at the southeastern corner of the UI property. Although the lines will span this easement area, forested vegetation will have to be cut to maintain mandatory clearance from the realigned 115-kV lines. UI will coordinate with the City of Bridgeport regarding this easement.

In addition, if needed to support the development of the new substation, a temporary construction staging area may be located at an existing commercial or industrial site in the vicinity of the Project. Such a staging area, if required, would be used for construction office trailers, equipment and materials storage, parking, etc. Typically, the location for a staging area/contractor yard would be identified in later stages of the Project planning process, with input from the Project construction contractor.

The Project will comply with the latest revisions of standards of the National Electrical Safety Code, the Institute of Electrical and Electronic Engineers and the American National Standards Institute; good utility practice; Connecticut regulations covering the method and manner of construction; UI's specifications and final engineering plans; and the conditions of approvals obtained for the Project.

Environmental Setting, Impacts, and Mitigation: UI researched data on existing environmental features in the region and conducted studies of environmental resources on and in the vicinity of the Project site. Information was compiled regarding ecological resources (soils, wetlands, watercourse, vernal pools, floodplains), vegetation and wildlife, federal- and state-listed species, land uses, cultural resources, visual resources, transportation, air quality, and noise. The Project site is in a mixed-use area, where lands include various retail and professional office facilities, a funeral home, residential development, and Bridgeport's Elton Rogers Woodland Park, an undeveloped largely forested area that borders the site to the east and south. The Eversource ROW extends through the park. Access to the Project site is via Kaechele Place and Main Street (State Route 111). The Merritt Parkway (State Route 15) is located about 0.3 mile north of the Project site.

UI's analyses determined that the Project is consistent with the long-established utility uses in the vicinity (i.e., the existing Old Town Substation and Eversource ROW) and will have a positive long-term effect on the reliability of the electric system in the Greater Bridgeport area, as well as in Connecticut. The new Old Town Substation and associated 115-kV line interconnections will be located entirely on UI property or within Eversource's ROW, with the exception of the approximately

0.15-acre easement that will be required on Bridgeport property to accommodate the overhead 115-kV transmission line connections to the new substation. UI anticipates that the Project will be designed and constructed to avoid permanent fill in the wetland located on the northern portion of its property.

Although the construction and operation of the Project will require the conversion of approximately 1.35 acres of forest land to utility purposes, the Project will be consistent with the adjacent utility uses and will not result in any expansion of the Eversource ROW. The Project's proposed easement on Bridgeport's property within Elton Rogers Woodland Park will not affect the overall passive (e.g., hiking) recreational use of the park and will be consistent with the Eversource ROW, which has traversed through the area for decades.

As a result, any environmental effects are expected to be minor and localized to the Project vicinity. UI will mitigate such impacts to the extent practical by implementing standard construction best management practices and conforming to the conditions of Project permits and approvals. Additional measures to avoid or minimize environmental effects may be identified as part of the ongoing engineering design and constructability reviews and consultations with the municipalities and/or regulatory agencies.

Electric and Magnetic Fields:
UI commissioned a study to measure the electric and magnetic fields (EMF) associated with the existing Old Town Substation and to model the anticipated EMF levels from the new substation. The preliminary study found that the proposed Project will not significantly change EMF levels in the vicinity because the configuration of the new substation and connecting transmission lines will be like that of the existing substation and lines. Thus the EMF levels in the vicinity of the new substation are expected to be a small fraction of those recommended for the general public by international health-based standards.

Alternatives: The proposed Project was selected as a result of a process whereby various alternatives were identified and assessed. Initially, UI evaluated the existing substations' asset condition, in relation to existing and future needs. After that evaluation found that the existing Old Town Substation equipment must be updated to conform to Company and industry standards and to address existing and future electric demand, UI eliminated the "No Action" alternative (i.e., "do nothing") because it would pose unacceptable risks to the resiliency of the electric transmission system and the continued provision of reliable service to customers in the Greater Bridgeport area. UI then conducted an analysis, identifying two primary options for upgrading Old Town Substation:

(1) In-kind replacement of the substation on the existing 0.9-acre substation site; or

(2) A rebuild alternative, involving the development of a new, upgraded 115/13.8-kV substation, either on UI property adjacent to the existing Old Town Substation or on a site located elsewhere, near Eversource's ROW that includes the 115-kV lines to which the substation must connect.

UI determined that Option 1 (in-kind replacement) was not feasible. As a result, UI focused on Option 2 (rebuild alternative), identifying and reviewing seven alternative properties, including the proposed Project site. To facilitate the required connections to Eversource's 115-kV lines, all the alternative sites necessarily had to be located adjacent to or near Eversource's transmission line ROW in Bridgeport or Trumbull.

UI assessed each of the alternative sites, based on site size, property ownership, proximity to the Eversource ROW, required distribution line connections, land use and environmental features,

constructability, and general cost. Except for the proposed Project site, all the alternatives would require UI to acquire property for the new substation. As a result of this review, all but the proposed Project site were dismissed from consideration due to various overriding factors (e.g., cost, feasibility of property acquisition, existing land use and environmental constraints, potential for regulatory / siting issues). In summary, the proposed Project represents the optimal solution for rebuilding the Old Town Substation, thereby enhancing the reliability of the electric system to the benefit of Connecticut and New England consumers.

Purpose of this Municipal Consultation Filing (MCF)

The proposed Project is subject to the statutes and regulations of the Connecticut Siting Council (Council) and other state agencies. In the second quarter of 2020, UI plans to submit to the Council the Project's *Application for a Certificate of Environmental Compatibility and Public Need* (Application). At least 60 days prior to the submission of such an application, the Council requires applicants to provide project information, in the form of a MCF, to the potentially affected municipalities.

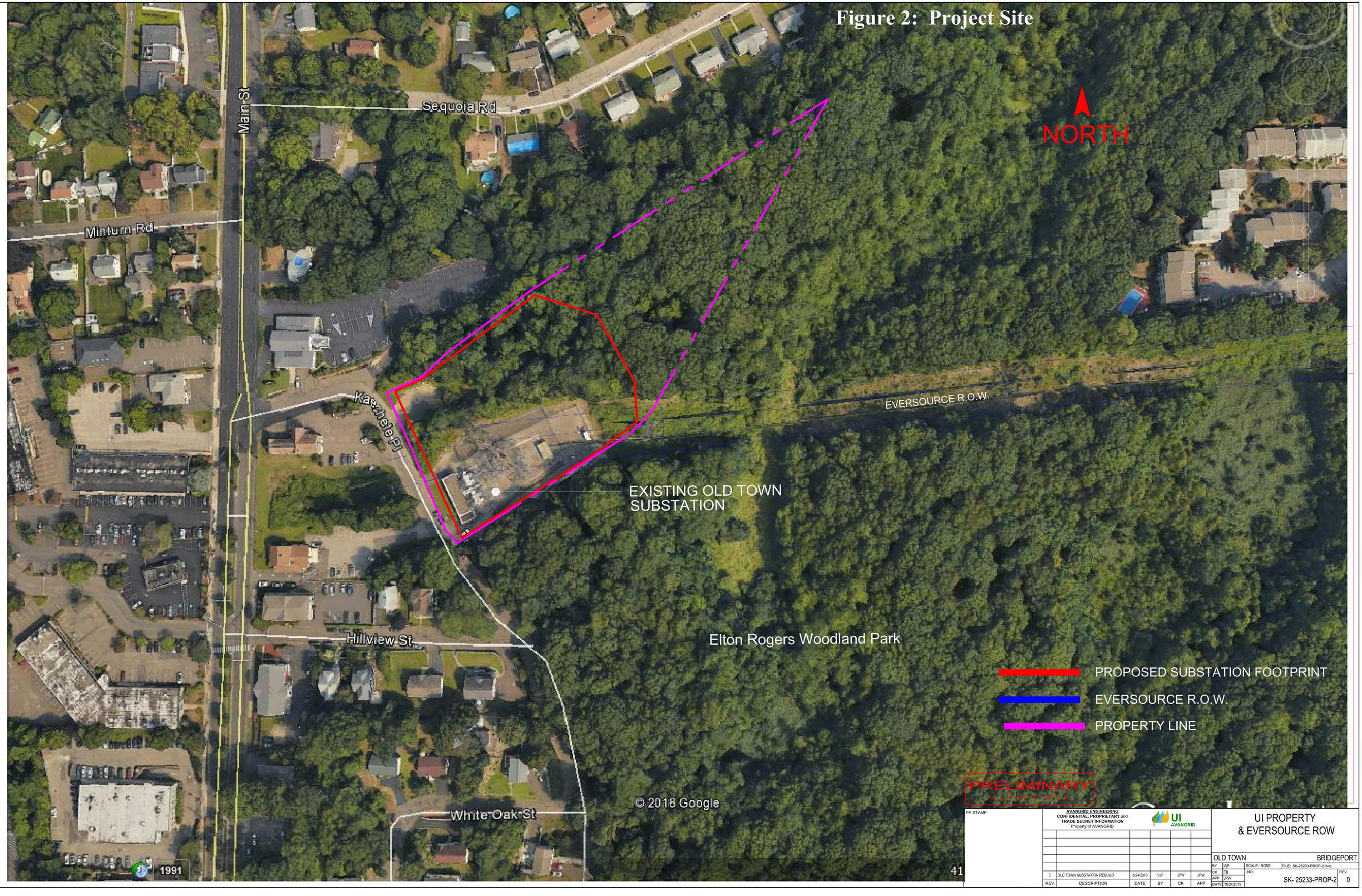
The proposed Project site for the new Old Town Substation is in Bridgeport. However, the Town of Trumbull's southern boundary is approximately 0.2 mile to the north of the Project site. In addition, several of the alternative sites that UI reviewed for the new substation are in Trumbull. As a result, pursuant to the Council's regulations, both Bridgeport and Trumbull are considered potentially affected municipalities.

This MCF is a primary mechanism for informing municipal representatives about the proposed Project and for soliciting comments about the Project. UI is providing this MCF, for review and comment, to representatives of both Bridgeport and Trumbull.

The MCF process extends for 60 days, during which time UI will offer to meet with municipal personnel to obtain input regarding the Project. In addition, UI plans to hold a public meeting in the City of Bridgeport to discuss the project with interested stakeholders.

The Application, which will follow a similar format, will incorporate responses to comments received during the MCF process.

Figure 2: Project Site



REV	DESCRIPTION	DATE	BY	CK	APP
D	REVISED PER COMMENTS	11/12/2019	VJP	JPW	JPW
C	REVISED PER COMMENTS	11/11/2019	VJP	JPW	JPW
B	REVISED PER COMMENTS	10/25/2019	VJP	RP	RP
E	REVISED PER COMMENTS	11/15/2019	VJP	JPW	JPW
0	OLD TOWN SUBSTATION REBUILD	8/24/2019	VJP	JPW	JPW

LOGO

INFO

ANSI D 11/15/2019

PE STAMP

AVANGRID ENGINEERING
CONFIDENTIAL, PROPRIETARY and TRADE SECRET INFORMATION
Property of AVANGRID

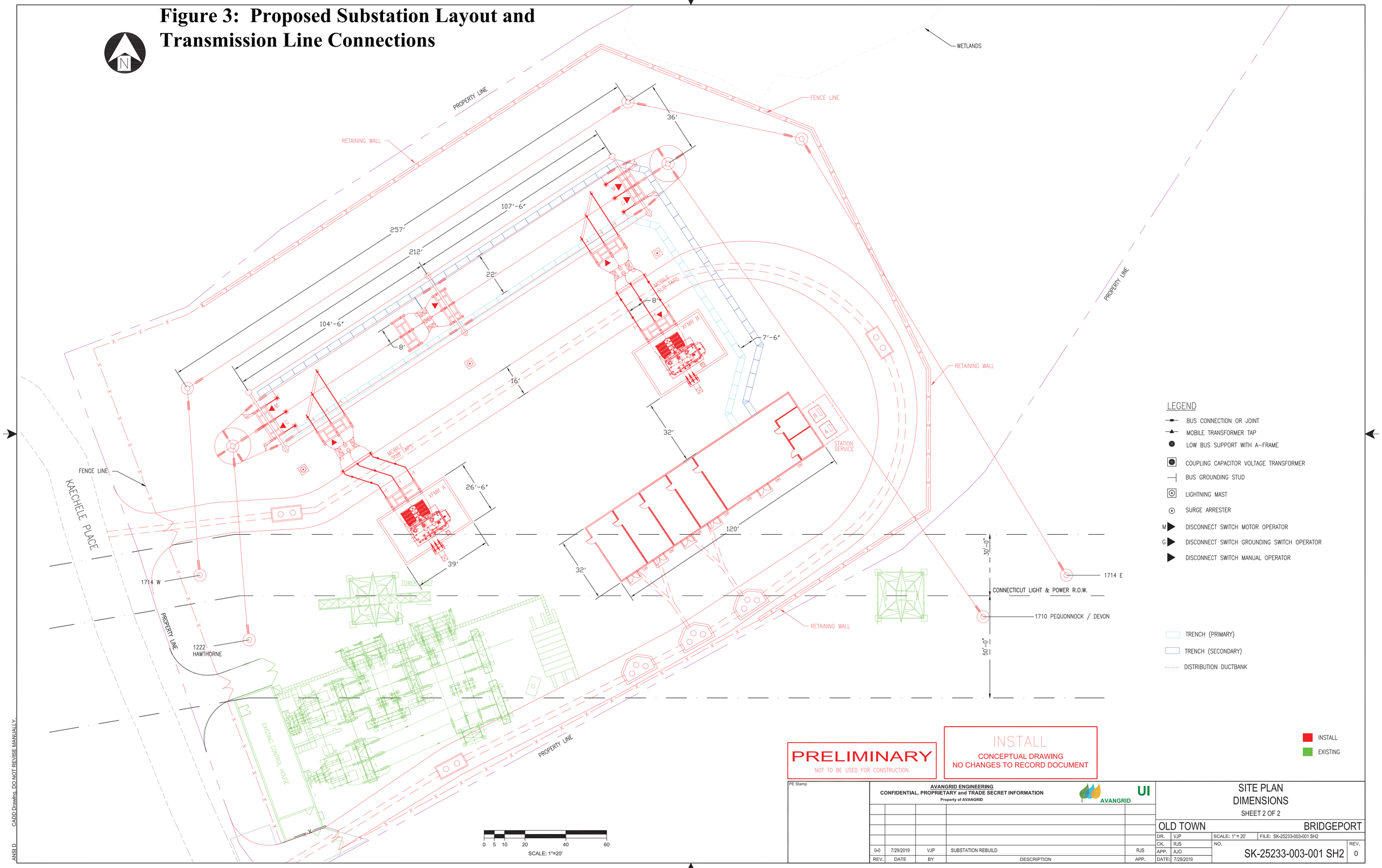
UI AVANGRID

UI PROPERTY & EVERSOURCE ROW

OLD TOWN — BRIDGEPORT

BY	VJP	SCALE: NONE	FILE: SK-25233-PROP-2.dwg
CK	TB	NO.	REV
APP	JPW	SK- 25233-PROP-2	0
DATE	10/24/2019		

Figure 3: Proposed Substation Layout and Transmission Line Connections



LEGEND

- BUS CONNECTION OR JOINT
- MOBILE TRANSFORMER TAP
- LOW BUS SUPPORT WITH A-FRAME
- COUPLING CAPACITOR VOLTAGE TRANSFORMER
- BUS GROUNDING STUD
- LIGHTNING MAST
- SURGE ARRESTER
- M DISCONNECT SWITCH MOTOR OPERATOR
- G DISCONNECT SWITCH GROUNDING SWITCH OPERATOR
- DISCONNECT SWITCH MANUAL OPERATOR
- TRENCH (PRIMARY)
- TRENCH (SECONDARY)
- DISTRIBUTION DUCTBANK

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

INSTALL
CONCEPTUAL DRAWING
NO CHANGES TO RECORD DOCUMENT

- INSTALL
- EXISTING

PE Stamp

AVANGRID ENGINEERING
CONFIDENTIAL, PROPRIETARY and TRADE SECRET INFORMATION
Property of AVANGRID

AVANGRID UI

REV.	DATE	BY	DESCRIPTION	APP.
0-0	7/29/2019	VJP	SUBSTATION REBUILD	RJS

SITE PLAN
DIMENSIONS
SHEET 2 OF 2

OLD TOWN — BRIDGEPORT

DR.	VJP	SCALE: 1" = 20'	FILE: SK-25233-003-001 SH2
CK.	RJS	NO.	REV.
APP.	AJO	SK-25233-003-001 SH2	0
DATE:	7/29/2019		

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1. PROJECT OVERVIEW AND NEED

1.1 PROJECT BACKGROUND, LOCATION, AND PURPOSE

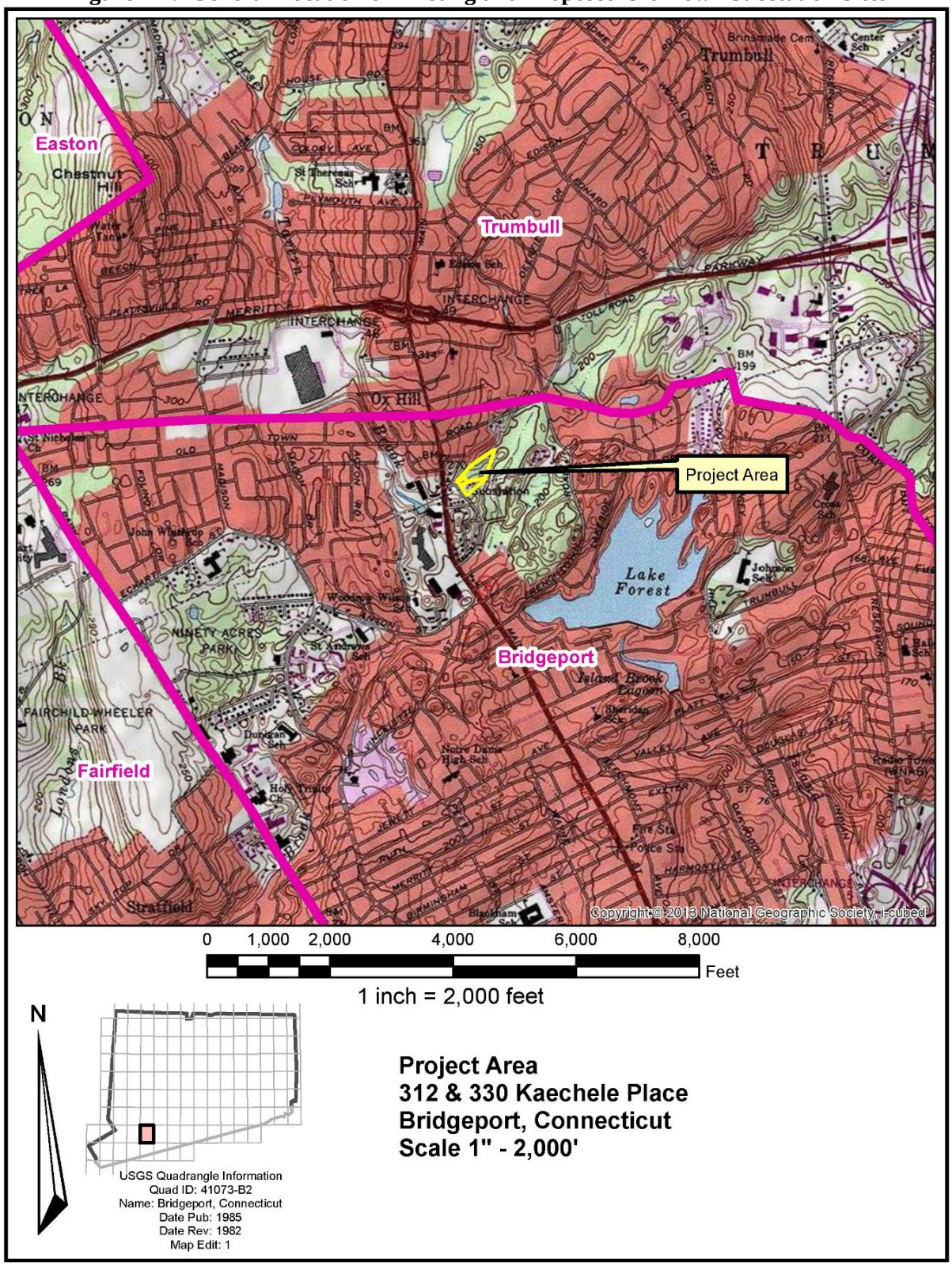
1.1.1 Project Objectives

To improve the bulk electric system in Connecticut, and in particular the Greater Bridgeport area, The United Illuminating Company (UI or the Company) proposes to rebuild its existing Old Town Substation, a 115/13.8-kilovolt (kV) transmission and distribution facility. The existing air-insulated substation (AIS), which was built more than 50 years ago is classified as a North American Electric Reliability Corporation (NERC) Bulk Electric System substation. The substation is located on an approximately 0.9-acre site at 280 Kaechele Place, in the northwestern portion of the City of Bridgeport, Fairfield County, Connecticut. After conducting studies to review current and future electric supply needs and to assess the physical condition of the substation equipment and infrastructure, UI determined that the existing Old Town Substation does not conform to Company and industry system performance standards for maintaining adequate, safe, and reliable service, and therefore must be replaced.

The Old Town Substation Rebuild Project (the Project) will entail the construction and operation of a new 115/13.8-kV transmission and distribution substation, proposed to be built on an adjacent parcel to the existing substation, on presently undeveloped property. The undeveloped property totals approximately 3 acres and is owned by UI at 312 and 330 Kaechele Place (also in the City of Bridgeport). Once completed, the new substation also will encompass the existing substation site. Overall, the new substation will occupy approximately 2.25 acres, including 0.9 acre of the existing substation parcel and approximately 1.35 acres of the adjacent 3-acre site. The remainder of the 3-acre site (i.e., approximately 1.63 acres) will not be developed. In addition, the Project will include minor modifications to link the new substation to the 115-kV transmission and distribution lines that presently connect to the existing Old Town Substation. After the new substation is placed into service, the existing Old Town Substation will be decommissioned.

Figure 1-1 identifies the general Project site, illustrating the location of the existing Old Town Substation and adjacent UI property in relation to the surrounding region. Appendix A includes maps and drawings that provide details regarding the proposed Project.

Figure 1-1: General Location of Existing and Proposed Old Town Substation Sites



Source: USGS Topographic Map, Bridgeport, CT 06605 Quadrangle

1.1.2 Description of Existing Old Town Substation and 115-kV/13.8-kV Line Connections

The existing Old Town Substation was constructed and placed into service in the early 1960s. The substation connects to two 115-kV transmission lines and steps down power delivered from these lines to feed UI's local distribution system. The substation is geographically located to feed the distribution capacity needs of the City of Bridgeport, as well as the neighboring towns of Easton, Fairfield, and Trumbull. However, approximately 90% of the substation's load is centered in Bridgeport and Trumbull.

The substation consists of the following facilities: substation yard, a control enclosure with two electrical distribution buses and distribution switchgear, 115-kV oil circuit breaker (OCB), two 60 megavolt ampere (MVA) 115/13.8-kV power transformers, a 115-kV bus structure, Number 3 13.8-kV bus enclosure, and one 13.8-kV 7.2 megavolt ampere reactive (MVAR) capacitor bank enclosure. The substation also includes the supporting structures for overhead transmission line switches and electric components, such as current transformers (CTs), capacitive coupled voltage transformers (CCVTs), and lightning arrestors. The substation bus structure is constructed primarily with 2,156 kcmil stranded wire strain bus.

A transmission line right-of-way (ROW) owned by the Connecticut Light and Power Company d/b/a Eversource Energy (Eversource) extends through the substation. This ROW supports three Eversource overhead 115-kV transmission lines (the 1710, 1714, and 1222 lines). Two of the 115-kV transmission lines terminate at Old Town Substation on an existing lattice tower:

- Extending east from the substation, the 1710 Line connects Old Town Substation to Eversource's Devon Substation in the City of Milford and UI's Pequonnock Substation in southern Bridgeport; and
- Extending west, the 1222 Line connects Old Town Substation to UI's Hawthorne Substation in the Town of Fairfield.

The same lattice tower also supports Eversource's 1714 Line, which bypasses Old Town Substation and links UI's Trumbull and Hawthorne Substations.

Figure 1-2 provides an aerial view of the existing substation in relation to the surrounding region, while Figure 1-3 presents a street-level view of the substation.

Figure 1-2: Existing Old Town Substation Site and Vicinity

Source: Google Earth (2019)

Figure 1-3: Street-Level View of Existing Old Town Substation, Looking East from Kaechele Place

As illustrated on Figure 1-2, the existing Old Town Substation is located on a 0.9-acre UI property bordered by undeveloped land owned by UI to the north and east and by the City of Bridgeport (Elton Rodgers Woodland Park) to the south. Kaechele Place, a local road, borders the site to the west. Lands in the immediate vicinity of Kaechele Place are used for a mix of commercial purposes (funeral home, office buildings, businesses), with some residences located to the south and west.

Old Town Substation is accessed via two driveways off Kaechele Place, both ends of which connect to Main Street (State Route 111). Old Town Road and the Merritt Parkway (State Route 15) are located approximately 0.2 mile and 0.4 mile to the north (via Main Street), respectively, providing primary east-west access in the vicinity of the Project. Sequoia Road, which extends east from Main Street and extends northeast to connect to Old Town Road, is located approximately 0.1 mile north of the existing substation.

Old Town Substation has been expanded several times over the past 50 years. For example, the control enclosure was expanded in the early 1980s to add transmission relaying and a Supervisory Control and Data Acquisition (SCADA) system; this expansion is on the south side of the enclosure. In response to distribution substation capacity needs in early 1980s, UI installed a prefabricated power distribution center referred to as the Number 3 bus enclosure building, which houses the circuit breakers and associated relaying schemes for four distribution feeders linked via two underground cables, one from each transformer.

In addition, the substation has distribution feeder ties with UI's Hawthorne, Pequonnock, New Congress 1 & 2, and Trumbull substations, allowing for load transfers between these stations. This interconnectivity is extremely valuable during regular switching operations, contingency conditions, and for permanent load transfers to relieve potential overloads on adjacent stations. Such switching is the primary means of balancing regional load between substations and as a preliminary measure to defer construction of additional distribution capacity.

1.1.3 Issues Regarding the Existing Old Town Substation and Need for the Project

The need for the Project was identified as a result of detailed analyses of the condition of the existing Old Town Substation, taking into consideration both existing and future requirements for assuring the reliability of the electric system. Overall, the need for the new substation stems from the age of the existing Old Town facility (more than 50 years old) and the fact that most of the substation's equipment

needs to be replaced now or in the near future in order to conform to industry and UI standards, as well as to provide reliable electric service to the region.

Specifically, as part of efforts to assess the condition of its transmission line and substation infrastructure, UI conducted studies to evaluate the present and future viability of the existing Old Town Substation. These studies included the following:

1. A comprehensive physical evaluation of the substation, involving analyses of the station foundations, perimeter fencing, grounding components, control wiring, conduit and control room;

2. A condition assessment of the existing short-circuit adequacy of equipment and bus structures, lightning protection, and conformance to National Electric Safety Code (NESC) clearance requirements and UI Design Standards; and

3. A 3D Light Detection and Ranging (LiDAR) survey of the 115-kV yard to evaluate conformance to American National Standards Institute (ANSI), NESC, and UI clearance requirements with a focus on the areas surrounding the 115-kV OCB and associated disconnect switches.

As a result of these studies, UI determined that the Old Town Substation exhibited the following deficiencies in terms of reliability performance and physical condition:

- **Inadequate Lightning Protection.** The substation's bus structure does not adequately protect the exposed equipment (e.g., disconnect switches) from direct stroke lightning strikes. A statistical analysis determined that there is a 99.8% probability that the exposed equipment would be damaged from lightning strikes.

- **Insufficient Control Enclosure Space.** The existing small control enclosure does not meet NESC criteria for sufficient work room and cannot be expanded further due to the small size of the existing substation site. As a result, the control enclosure cannot be upgraded to support any needed improvements at the station.

- **Single Point of Failure.** Both mains to and feeders from the Number 3 bus enclosure extend through the same manhole in the substation yard. This design is unique to Old Town Substation and is not found elsewhere on UI's system. A catastrophic event in this manhole, such as a cable fault, has the potential to de-energize the entire substation as these sections of cable are covered by the transformer differential protection scheme. Thus, there is a significant risk of interrupting all customer load supplied by the substation for an extended period due to the design of this manhole.

- **Bus No. 3 Enclosure Problems.** The Number 3 Bus enclosure requires remediation to eliminate reoccurring issues associated with the buckling of the bus room floor. While maintenance has been performed to address the incoming breaker issues, the underlying problem leading to these failures persists, requiring increasingly frequent and more difficult maintenance due the age of the equipment and the lack of available replacement parts.

- **OCB Replacement.** The substation's 115-kV OCB is obsolete and poses increased risks of failure. UI plans to replace the OCB with a gas insulated circuit breaker.

- **Lack of Mobile Substation Access.** UI owns two 50 MVA 115/13.8-kV mobile substation transformers that can be deployed to substations in the event of a transformer failure, thus maintaining service to customers. However, the existing Old Town Substation was designed for a single point of access for mobile substation deployment and has insufficient space to deploy even UI's smallest mobile substation transformer without violating clearances to the overhead strain bus. Further, the only available location for a mobile substation transformer is over the substation's septic system; no other space is available due to the location of substation equipment and the small overall size of the existing station site.

- **Disconnect Switch Maintenance Issues.** The OCB disconnect switches are outdated and are increasingly difficult to maintain due to the absence of replacement parts and long lead times for specialty fabricated components. Moreover, the disconnect switches do not conform to current ANSI standards. As a result, the switches must be replaced.

- **Corroded CCVTs.** Two 1710 Line CCVTs require replacement. These CCVTs are badly corroded with a high risk of moisture penetration into the internal components.

After assessing the issues associated with the existing Old Town Substation equipment and determining that the existing substation site was not large enough to accommodate the improvements required, UI determined that the optimal solution would be to rebuild the substation, upgrading all facilities to conform to current Company and industry standards.

1.2 SUMMARY OF PROPOSED PROJECT FACILITIES

The Project will entail the construction and operation of a new Old Town Substation, which, like the existing substation, will be an AIS design, as well as the relocation of the 115-kV transmission line and distribution line connections to the substation. Appendix A includes detailed maps and drawings of the proposed Project facilities.

1.2.1 Proposed Project Site: Location and History

The new Old Town Substation is planned to be built on approximately 2.25 acres of UI property. Approximately 1.35 acres will be on UI's approximately 3-acre property that borders the existing Old Town Substation site; the new substation will also encompass the 0.9-acre existing substation site (refer to Figure 1-4). The approximately 3-acre UI property is presently undeveloped, consisting mostly of forested areas, and is bordered to the east by the City of Bridgeport's Elton Rodgers Woodland Park, to the north by the back yards of residences along Sequoia Road, to the south by the existing substation and undeveloped property, and to the west by Kaechele Place.

Figure 1-4: Proposed Project Site and Transmission Line ROW

Source: Google Earth (2020)

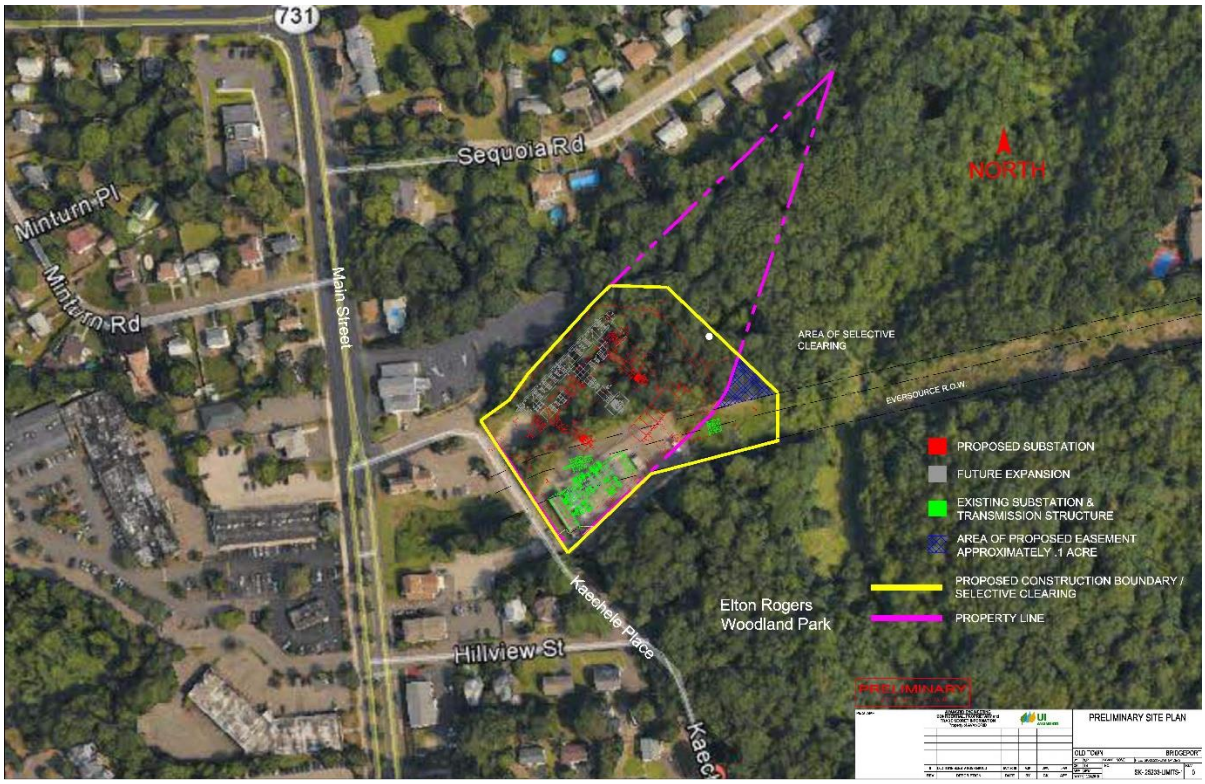
Historically, the Project site was undeveloped through the first portion of the twentieth century, although aerial photography dated 1934 shows the existing Eversource transmission line ROW extending east-west across the current UI property. Between 1935 and 1951, a residence was built on a portion of the 3-acre property, adjacent to Kaechele Place. This residence was demolished and removed in 2011.

UI purchased the 0.9-acre existing substation site in 1961 and built the existing Old Town Substation in the mid-1960s. UI acquired the two adjacent properties (312 and 330 Kaechele Place) in December 2009.

1.2.2 Proposed Substation Facilities and Transmission Line Connections

The proposed Old Town Substation will consist of new facilities to directly replace and upgrade all the existing 115-kV and 13.8-kV components at the existing station. The new substation will occupy approximately 2.25 acres and will encompass the 0.9-acre site of the existing Old Town Substation. The alignment of Eversource's existing ROW through the UI property will not be affected. Figure 1-5 illustrates the proposed layout for the new substation.

Figure 1-5: Proposed Substation Layout



Source: UI 2019

The new 115-kV AIS substation will be designed in a two-transmission line, single-breaker arrangement, expandable to a two-bay breaker and one-half arrangement, with two 45/60/75MVA, 115/13.8-kV Power Transformers with a plan for a future third transformer, as well as a future 115-kV capacitor bank. The substation will include new 115-kV and 13.8-kV switchyard equipment, a new control enclosure and 13.8-kV switchgear enclosure, as well as modifications to the 115-kV overhead transmission lines and optical ground wire (OPGW) fiber optic cables.

Specifically, the two Eversource transmission lines (the 1710 and 1222 lines) that presently connect to the existing Old Town Substation will be modified and rerouted slightly to connect to line terminals at the new substation. The 1714 Line will be re-routed through the substation yard as a provision for future connection.

In total, nine new steel monopoles will be installed. Each of the two lattice towers will be replaced with two monopoles; these four monopoles will be located on the Eversource ROW- two within the substation and two on the ROW immediately to the east of the substation (refer to Figure 1-5). The five remaining new monopoles, all within the substation boundaries, will support the 115-kV line

connections to the new substation, as well as the 1714 Line realignment through the substation. The transmission line modifications will be coordinated with Eversource.

After the new substation is placed into service, the existing Old Town Substation will be taken out of service, decommissioned and removed. Similarly, after the new 115-kV structures are installed and the 115-kV transmission lines are connected to the new substation, the two existing lattice steel structures on UI property at the existing substation and on Eversource's ROW will be removed.

1.3 ORGANIZATION AND PURPOSE OF THE MCF

The proposed Project is subject to the regulations of the Connecticut Siting Council (Council or CSC) and other state regulatory agencies. In the second quarter of 2020, UI plans to submit to the Council the Project's *Application for a Certificate of Environmental Compatibility and Public Need* (*Application*). Prior to the submission of such an application, the Council requires applicants to provide project information, in the form of a Municipal Consultation Filing (MCF), to the potentially affected municipalities.

Both the existing and proposed Old Town Substations are in the City of Bridgeport, which is the only municipality that would be directly affected by the Project construction. However, the Project site is approximately 0.2 mile south of the southern boundary of the Town of Trumbull. Thus, pursuant to the CSC's regulations, UI is providing copies of this MCF to both the City of Bridgeport and the Town of Trumbull. After submission of the MCF, UI will offer to meet with the chief elected officials of both municipalities in order to discuss the proposed Project.

The MCF is a primary mechanism for informing the public and municipal representatives about a proposed project and for soliciting comments about the project, which then can be addressed in the project's application to the Council. To provide the public and municipal representatives with currently available information concerning the Old Town Substation Rebuild Project, this MCF is formatted to include the same types of information that will be presented in the Project's *Application*. Thus, the MCF:

- Describes the need for the proposed Project, the location of and assets at the existing substation, and the proposed substation site and facilities (Section 1);
- Provides technical specifications for the proposed Project facilities, including the new substation facilities and transmission / distribution line relocations, as well as the Project cost (Section 2);

- Describes construction and operation / maintenance information for the proposed Project facilities, including anticipated construction work hours (Section 3);
- Discusses existing environmental resources (including cultural resources and visual resources), potential Project impacts, and impact mitigation measures (Sections 4 and 5);
- Provides data concerning electric and magnetic fields (EMF) associated with the Project facilities. (Section 6);
- Identifies the proposed Project schedule (Section 7);
- Reviews the permits, approvals, and consultations completed to date and expected to be performed for the Project (Section 8); and
- Discusses the alternatives analyses that led to the selection of the Project at the proposed site (Section 9).

Section 10 provides a glossary of terms and acronyms used in the MCF. Appendices include supporting information compiled to date regarding the Project, including plans and drawings, as well as transmission line cross-sections (Appendix A); copies of agency correspondence (Appendix B); and environmental resource and technical reports (Appendices C-F).

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2. TECHNICAL SPECIFICATIONS FOR THE PROJECT

The technical specifications contained in this section are based on currently available data concerning the Project. As the Project planning and engineering design processes proceed, these technical specifications will be refined.

2.1 LAND AND ACCESS REQUIREMENTS

The new Old Town Substation is planned to be built on UI property, adjacent to and encompassing the existing substation site. The new substation, like the existing station, will be accessible via Kaechele Place; however, as part of the Project, two separate entrances/exits to the substation via Kaechele Place will be installed.

All primary construction activities are expected to be confined to UI property or to the existing Eversource 115-kV transmission line ROW in the immediate vicinity of the substation. However, if needed to support the development of the new substation, a temporary construction staging area may be located at an existing commercial or industrial site in the vicinity of the Project. Such a staging area, if required, would be used for construction office trailers, equipment and materials storage, parking, etc. Typically, the location for a staging area / contractor yard, if needed, would be identified in later stages of the Project planning process, with input from the Project construction contractor.

The Appendix A maps illustrate the locations of the Project's currently proposed access roads and work areas.

2.1.1 Proposed Substation

The new substation is proposed to be built on approximately 2.25 acres of UI's 3.88-acre property (i.e., the existing 0.9-acre substation site plus the two adjacent parcels that together total approximately 3 acres). The new substation will be situated northeast of and adjacent to the existing Old Town Substation. (Refer to Figure 1-5 and the Appendix A maps.)

All access for the construction and operation of the new substation is expected to be via Kaechele Place, which provides direct connections to Main Street (State Route 111). As part of the Project, UI will

develop a new access road into the site from Kaechele Place and, as necessary, will improve the current access that extends off Kaechele Place to the existing Old Town Substation.

2.1.2 Transmission Line Connections to the New Substation

Access roads and work pads will be required to install the new monopole structures necessary to realign Eversource's 1710, 1714, and 1222 lines from the existing substation to the new Old Town Substation. All the required access roads and work pads will be on UI property or within Eversource's existing ROW. The Appendix A maps illustrate the anticipated locations of the access roads and work areas on Eversource's ROW that will be required to install the new transmission line structures and remove the existing lattice steel towers.

2.1.3 Existing Substation Decommissioning and Transmission Line Removals

Work to decommission the existing Old Town Substation, which will be conducted principally after the new substation is placed in service, will be performed within UI's existing 0.9-acre property, using established access from Kaechele Place. Similarly, the removal of the existing transmission line connections (refer to the Appendix A maps) will be conducted on UI property or on Eversource's ROW.

2.2 NEW SUBSTATION FACILITIES

The proposed Old Town Substation will include new 115-kV switchyard equipment, a new control enclosure and 13.8-kV switchgear enclosure, overhead transmission line and OPGW fiber optic cable modifications, and related new equipment. The substation will be designed for future expansion to a four-transmission-line, two-bay, breaker-and-one-half arrangement with three power transformers and a future 115-kV capacitor bank connection.

Figure 2-1 generally illustrates the proposed substation layout. Additional site plan information is included in Appendix A.

Figure 2-1: Proposed Substation Layout

The primary substation equipment and facilities will include:

- A new approximately 3,840 square-foot control enclosure and 13.8-kV switchgear enclosure, with approximate dimensions of 16 feet in height by 120 feet long by 32 feet wide. This enclosure will include the following components:
  - Protection and control panels with associated relay and metering equipment
  - Battery banks and associated chargers
  - AC/DC distribution panels
  - Lavatory facility
  - Communication equipment
  - HVAC equipment
  - The switchgear room will accommodate construction of four new lineups of indoor 13.8-kV GIS switchgear separated with space for future additions
- Two 115/13.8-kV 45/60/75 MVA power transformers
- Three 115-kV SF6 dead tank circuit breakers
- 115-kV disconnect switches
- CCVTs
- Associated 115-kV insulators, tubular aluminum bus, surge arrestors, and connectors
- Provisions to accommodate a temporary mobile transformer for emergency conditions
- Lightning masts
- Associated structural steel to support electrical equipment

A perimeter chain link fence with privacy slats, approximately 14 feet in height and topped with an additional 1 foot of barbed wire, will be installed around the substation. In addition, to accommodate the existing site topography and minimize grading to the extent practical, a concrete retaining wall will be built around portions of the perimeter of the substation. The chain link fencing will be installed on top of the retaining wall. The site plan in Appendix A illustrates the proposed location of the substation's perimeter fence and retaining wall.

As illustrated on the Appendix A maps and drawings, the new Old Town Substation will be designed to meet or exceed all state building and fire codes, including provisions for seismic loading, wind loading, and snow / ice loading.

2.3 SUBSTATION TRANSMISSION LINE CONNECTIONS

UI proposes to relocate Eversource's two 115-kV transmission lines (i.e., the 1710 and 1222 lines) that presently feed the existing Old Town Substation to connect to the new substation. In addition, Eversource's 1714 Line, which bypasses the existing substation, will be realigned to allow a future connection to the Old Town Substation, if needed to meet anticipated electricity demand in the substation's service territory. Technical specifications regarding the existing and proposed 115-kV line connections are described below and illustrated on the Appendix A maps, cross-sections, and drawings.

2.3.1 Existing 115-kV Line Connections

At the existing Old Town Substation, the Eversource's overhead transmission lines are supported on two approximately 105-foot-tall lattice steel structures, one located adjacent to the eastern substation property and one located within the substation.

2.3.2 Proposed 115-kV Line Connections

The existing Eversource transmission line connections to the new substation will be relocated as shown on Figure 2-1 and the Appendix A maps and drawings. Specifically, the 1710 and 1222 lines will connect to the line terminals at the new substation. The 1714 Line will be re-routed through the substation yard in anticipation of a future connection to the rebuilt substation. In total nine new steel monopoles will be installed.

As illustrated on Figure 2-1 and the Appendix A maps, the two existing lattice steel towers will be replaced with four new steel monopoles, which are not expected to exceed the current 105-foot tall lattice structures. All four of these monopoles will be within Eversource's ROW; two on the ROW

east of the substation and two on the portion of the ROW that extends through the substation. The remaining five new monopoles, which also are expected less than the current 105-foot tall lattice structures, will be built within the substation. In total, five new monopoles will support the 1714 Line, two will support the 1710 Line, and two will support the 1222 Line.

The transmission line modifications will be coordinated with Eversource. As UI proceeds with the engineering design of the Project, the final locations and heights of the new transmission line structures may be modified slightly from those illustrated in Figure 2-1 and the maps in Appendix A.

2.4 ESTIMATED PROJECT COSTS AND FACILITY SERVICE LIFE

The estimated cost for the siting, design, and construction of the Project is currently approximately $40 million. The substation equipment, transmission lines, and supporting infrastructure are expected to have a service life of approximately 40 years.

2.5 DECOMMISSIONING APPROACH: EXISTING OLD TOWN SUBSTATION AND RELATED TRANSMISSION LINE CONNECTIONS

After the new Old Town Substation is constructed, the 115-kV transmission lines and 13.8-kV distribution lines are connected, and the facility is placed into service, UI will decommission the existing Old Town Substation and associated 115/13.8-kV line connections. This work will include:

- Decommissioning and removing electrical components within the substation (e.g., 115-kV 60 MVA Transformers, OCB, bus and structures, CCVTs, switchgear, control enclosure);
- Removing above-ground structural components within the substation; and
- Dismantling and removing the existing overhead transmission line connections to the substation (e.g., removal of conductors, arms, structures, and (as appropriate) foundations for structures and equipment).

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3. PROPOSED CONSTRUCTION AND OPERATION/MAINTENANCE PROCEDURES

UI will construct, operate, and maintain the new Old Town Substation in full compliance with the latest revisions of standards of the NESC, the Institute of Electrical and Electronic Engineers (IEEE) and the American National Standards Institute (ANSI); good utility practice; and UI's specifications, final engineering plans, and the conditions of approvals obtained for the Project.

3.1 CONSTRUCTION PROCEDURES: GENERAL

Pursuant to the Council's requirements, prior to the commencement of construction activities, UI will prepare and submit a Development and Management (D&M) Plan to the Council for review and approval. Project construction will be performed in accordance with the D&M Plan, which will reflect conformance to the conditions of the Council's approval of the Project, as well as compliance with other regulatory requirements and UI specifications. UI will monitor and perform inspections of Project construction activities for conformance to these requirements.

3.2 SUBSTATION AND 115-KV LINE CONNECTIONS CONSTRUCTION

3.2.1 Construction Sequence

The Project will require construction staging areas (refer to Section 3.2.2) and will be developed in several stages. Table 3-1 summarizes the general sequence of activities for the construction of the new substation and the relocation of the associated 115-kV lines. These activities are discussed in Sections 3.2.3 and 3.2.4.

During construction, certain work activities and sequences may vary, based on factors such as final Project design and the conditions of the Council's or other regulatory approvals. Additional details regarding construction procedures and sequencing will be provided in the Project's D&M Plan.

Table 3-1: General Project Construction Sequence

TYPICAL CONSTRUCTION ACTIVITIES
Substation
• Perform vegetation management (tree and vegetation removal); and concurrent installation of erosion and sedimentation control measures
• Prepare the site for development (fill, grading) and construct retaining wall; install temporary perimeter fencing
• Install pre-engineered control enclosure and control room foundation, substation foundations, conduits, grounding grid, and distribution facilities
• Install overhead transmission line structure foundations
• Install 13.8-kV equipment enclosure,
• Install 115-kV equipment inside enclosure
• Install underground 115-kV duct banks
• Spread trap rock
• Offload and install power transformers
• Install 13.8-kV switchgear in 13.8-kV equipment enclosure; steel structures and outdoor substation equipment
• Install permanent fence
• Pull and terminate control wiring
• Commission/test the substation
• Install overhead transmission line conductors and insulators
• Perform 115-kV circuit by circuit transmission line cutovers; perform 13.8-kV circuit by circuit distribution line cutovers
• Install asphalt access drive; complete site restoration activities; remove temporary erosion and sedimentation control measures after site stabilization is achieved
• Decommission old substation
Transmission Line Connections
• Locate and mark utilities, stake work area boundaries
• Establish erosion and sedimentation controls; prepare access and work pads to the structure locations
• Install new structure foundations and assemble/erect new structures
• Install conductors, shield wire, and OPGW on relocated transmission line connections
• Remove structures, conductors, shield wire, and OPGW from the existing line connections to the old substation
• Energize the line connections in conjunction with new substation energization
• Remove temporary construction access and work pads, and restore/stabilize areas affected by construction
• Maintain erosion and sedimentation controls until area affected by construction are stabilized

3.2.2 Construction Staging Areas and Traffic Management

UI owns all property required for the new substation. UI will coordinate with Eversource regarding temporary or permanent easements for workspace and access for the installation of the new overhead structures within and adjacent to the substation, on Eversource's 115-kV ROW. UI also will coordinate with Eversource for the removal of the existing 115-kV line connections to the present Old Town Substation.

Staging for Project construction support (e.g., for material laydown, parking for vehicles and equipment, temporary construction trailer) is expected to be located on the Project site and/or at one or more industrial/commercial sites nearby. Temporary access for the transmission line relocations will be via UI's property and Eversource's existing ROW, as depicted on the Project plans in Appendix A. UI anticipates that approximately 1 acre, including access, of temporary workspace will be required to install the two new 115-kV monopole structures and remove the existing lattice structure on the Eversource ROW immediately east of the new substation. Other work areas are expected to be within the Project site. Additional details about staging and temporary work areas will be provided in the D&M Plan.

During construction, local roads will be used to access the Project work site. To minimize the potential for traffic delays on local roads, UI will coordinate as necessary with the City of Bridgeport and the Town of Trumbull regarding vehicular traffic management.

3.2.3 Substation Construction

Site Preparation

Site preparation work will include vegetation removal (including tree removal), as well as grading and filling. Because of the varied topography on the Project site, considerable grading and filling work is expected to be required. To minimize the amount of grading required, a concrete retaining wall, approximately 700 feet in length and ranging in height from approximately 2 to 10 feet depending on cut and fill requirements, will be built around the portions of the substation perimeter (refer to Figure 2-1 and the Appendix A maps).

Blasting

On portions of the Project site, bedrock may be encountered at shallow depths. To the extent practical, UI will use mechanical measures (e.g., hoe ramming, chipping) to remove bedrock as necessary to create a level site for the development of the substation and for substation equipment foundations. However, based

on the depth, extent, and type of bedrock identified during detailed subsurface studies of the Project site, controlled blasting could be required.

If blasting is necessary, UI will retain a blasting contractor licensed by the Connecticut Commissioner of Emergency Services and Public Protection to develop a blasting plan for the Project site. The resulting blasting plan, which would be provided to the Bridgeport Fire Marshall, would comply with state and local regulations and would take into consideration the site's geologic conditions, as well as the locations of nearby utilities and land uses. The blasting plan typically would contain information about the blasting work to be performed, schedule, safety, noise and vibration monitoring, pre- and post-blast inspections, and traffic control measures, as warranted. Detailed information regarding the contents of a blasting plan would be included in the Project's D&M Plan.

Foundation and Equipment Installation

The installation of foundations will typically involve excavation, form work, use of steel reinforcement, and concrete placement. Excavated materials will be handled in accordance with appropriate regulatory requirements and will be disposed of properly, off-site as required. After foundations are in place, structures and equipment will be installed pursuant to the new substation plans. The installation of the major 115-kV equipment is expected to take approximately 12 months and will involve the use of cranes to unload and place large equipment and structural elements.

The installation of the 115-kV monopoles, interconnection of the supply lines to the substation, and connections to the existing distribution system will occur inside and outside of normal work hours (refer to Section 3.5) because these activities necessitate taking critical transmission and/or distribution equipment out of service. As a result, UI will schedule this work for off-peak electrical demand hours and will coordinate, as appropriate, with the City of Bridgeport and the Town of Trumbull.

The substation will include two 115/13.8-kV transformers that will contain insulating (mineral) oil. The transformer equipment will each have a secondary containment designed to hold 110% of a transformer's fluid capacity and will include accidental spill prevention measures. UI proposes to install a petro barrier gravity drain system to assist in minimizing the potential for inadvertent oil discharges from the containment. Further, UI will remotely monitor a low oil level alarm that is integral to the system and will notify UI in the event of an abnormal condition at the substation.

Wiring, Testing, and Interconnections

Wiring that will allow the equipment to operate and communicate with the system protection equipment will be installed. After all equipment is installed and wired, the new equipment will be tested to confirm that it is in proper functioning condition and is operating as specified.

Final Site Cleanup/Restoration and Site Security

The portions of the substation not otherwise occupied by equipment and enclosures will be stabilized as necessary, typically with rock/gravel. UI will enclose the perimeter of the substation with a 14-foot-high chain link fence with privacy slats, topped with an additional 1 foot of barbed wire to discourage unauthorized entry and/or vandalism. On those portions of the site where the retaining wall will be built, UI will install the chain link fence on top of the retaining wall to achieve a total height of 14 feet. UI also will install lighting within the substation yard.

3.2.4 Substation Connections: 115-kV Line Relocations

Site Preparation

Temporary construction work pads will be established as needed to install the new transmission line structures. The locations of work pads and access to them will be identified in the D&M Plan.

Foundation and Structure Assembly/Installation and Conductor Work

The seven new monopole structures to be located within the substation site (five on UI property, two within the Eversource ROW) are expected to be installed on concrete drilled pier foundations. The two new monopoles that will be installed within Eversource's ROW to the east of the substation may be direct embed or have drilled shaft foundations. Foundation designs will be determined as the Project planning proceeds and will be described in the Project's D&M Plan.

The structure foundations will be excavated by heavy equipment. The foundations will utilize steel rebar for strength and anchor bolts for equipment mounting. The concrete will be brought to the structure locations via concrete trucks from a local ready-mix concrete plant.

The construction of the new structures will be sequenced, based on structure location. The new structures (and conductors) that are not located near the existing transmission line connections to the current Old Town Substation are expected to be installed first. When the new substation is ready to accept the 115-kV lines, the remaining structures and conductors / OPGW will be installed. Transmission terminations and any other transmission structures not requiring an outage will be constructed prior to any outage required

for relocating the new lines. New conductors will be installed between structures where outages are not required.

Removal of Existing 115-kV Structures

UI will coordinate with Eversource regarding the removal of the two existing lattice steel towers. Removal activities will typically include dismantling the towers and recycling materials to the extent practical. Materials that cannot be recycled or reused will be disposed of properly.

Cleanup and Restoration

After the installation of the new 115-kV structures and the removal of the old structures, temporary work pads and access will be removed, and the areas affected by Project construction will be restored and stabilized. Permanent work pads and access would remain.

3.3 EXISTING SUBSTATION DECOMMISSIONING

The existing Old Town Substation and associated line connections will be decommissioned in accordance with standard UI protocols and any applicable regulatory requirements. Details regarding the decommissioning of these facilities, which will be performed after the Project facilities are operational, will be provided as appropriate in the D&M Plan.

3.4 EROSION/SEDIMENTATION CONTROL AND STORMWATER MANAGEMENT

The Project will conform to applicable regulations concerning soil and erosion control and stormwater management. In accordance with the Connecticut Department of Energy and Environmental Protection's (CT DEEP's) *General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities (General Permit),* UI will prepare a Stormwater Pollution Control Plan (SWPCP) for the construction of the Project and will adhere to the *2002 Connecticut Guidelines for Sedimentation and Erosion Control*, which are designed to avoid or minimize potential adverse environmental effects that may result from construction activities. In addition, any spoils generated during Project construction will be managed in accordance with UI procedures and applicable regulatory requirements.

3.5 CONSTRUCTION SCHEDULE AND WORK HOURS

All construction activities will be conducted in accordance with the work hours to be identified in the Project's D&M Plan, which must be approved by the Council. In general, Project construction (the new substation and line connections, as well as the removal of the 115-kV line connections to the existing Old

Town Substation) is expected to require approximately 18-24 months.[1] (Refer to the Project schedule in Section 7 for additional information.)

Work Hours. Typical construction hours will be from 7:00 AM to 7:00 PM, Monday through Saturday. Construction personnel may arrive for and leave work after these times; however, noise-generating construction activities typically will not be performed before 7:00 AM or after 7:00 PM.

Some extended hours and Sunday work will be necessary on a limited basis. For example, extended hours will be needed for construction work that must occur on a continuous basis (e.g., concrete pours and setting for foundations) or that must be scheduled in accordance with outage requirements.

General Schedule. Site preparation (e.g., grading, filling, installation of the retention wall) and foundation installation will be performed during the initial six months of Project construction and will involve the use of earth-moving equipment and other construction vehicles. The installation and testing of substation equipment is expected to take approximately 18 months. These activities will involve the use of cranes to unload and install structural elements and large equipment.

To connect the 115-kV lines, substation terminal structures, and the distribution lines, certain transmission and/or distribution equipment will have to be taken temporarily out of service. As a result, this work will be coordinated with the Connecticut Valley Electric Exchange (CONVEX), which operates the electric transmission system in Connecticut and western Massachusetts. To complete these interconnections as efficiently as possible with minimal service disruptions, work will have to be performed continuously, requiring construction activities outside of normal work hours, as noted above.

3.6 DISTRIBUTION LINE RELOCATION AND CONNECTIONS

To deliver power from the substation into UI's electric distribution system in the Greater Bridgeport area, the distribution circuits that connect to the existing Old Town Substation will be extended and reconfigured as necessary to link to the new substation. These distribution circuits will consist of duct lines and splice chambers, which will be buried on UI property, as well as beneath local roads. The distribution circuit get-away from the new substation will be two new polyvinyl chloride (PVC) underground duct banks from the substation property exiting directly from new splice chambers. The new PVC duct banks will be installed from the splice chambers to existing distribution duct banks or overhead pole lines.

[1] UI has not finalized plans for decommissioning the existing Old Town Substation. However, the decommissioning work could extend beyond the schedule for the completion of the new substation and line connections.

3.7 PROJECT FACILITIES RELIABILITY, SAFETY AND SECURITY INFORMATION

UI will operate and maintain the new Old Town Substation in accordance with standard UI protocols, required industry standards, and good utility practice.

Emergency Operations and Shutdown

UI will equip the substation with measures designed to ensure continued service in the event of outages or faults in transmission or substation equipment. If an energized line or piece of substation equipment fails, protective relaying equipment will immediately remove the failed line or equipment from service, thereby protecting the public and the remaining equipment within the substation.

The Project design includes protective relaying equipment to automatically detect abnormal system conditions (e.g., a faulted overhead transmission line) and to send a protective trip signal to circuit breakers to isolate the faulted section of the transmission system. The protective relaying schemes will include fully redundant primary and backup equipment so that a failure of one scheme will not require the portion of the system being monitored by the protective relaying equipment to be removed from service. The protective relaying and associated equipment, along with a SCADA system for 24/7 remote control and equipment monitoring, will be housed at UI's System Operations Center.

Fire Detection and Suppression Technology

UI incorporates IEEE/ANSI and National Fire Protection Association (NFPA) standards for fire protection in its substation design and operates its facilities to minimize the impact of fire, in the unlikely event of such an occurrence. UI also trains its employees and the local fire department on the safe methods to deal with a substation fire.

At the new Old Town Substation, UI will secure the control enclosure and equip it with fire extinguishers and remotely monitored smoke detectors. In the event of a fire, the smoke detectors will automatically activate an alarm at UI's System Operations Center, and the system operators then will take appropriate action.

Physical Site Security

UI will use fencing and gates to protect the Old Town Substation; access will be limited to authorized personnel only. Security devices will constantly monitor the substation to alert UI of any abnormal or emergency situations. UI's planned physical site security measures for the substation are outlined as follows:

- A 14-foot-high chain link fence with privacy slats, topped with an additional 1 foot of barbed wire, will be installed around the substation perimeter to discourage unauthorized entry and/or vandalism. The fence will be installed on top of the retaining wall that will encompass the perimeter of portions of the substation; in such areas, the retaining wall plus the fence will have a combined height of 14 feet.

- Security cameras and motion detectors will be installed to provide complete visibility within the interior of the proposed substation and perimeter fence.

- The substation yard will be gated and locked. All gates will be padlocked at the end of the workday during construction activities and at all times once the substation is in service.

- Appropriate signs will be posted at the substation fence and gates, alerting the general public of the presence of high-voltage facilities.

- UI will install low-level LED lighting within the substation yard to facilitate work at night or during inclement weather, as well as to identify entry by unauthorized personnel.

3.7 TRAFFIC MANAGEMENT DURING SUBSTATION OPERATION

UI will design the substation for remote operation, with personnel on site only for periodic inspections, maintenance, and (as needed) emergency work. Permanent access to the substation will be via two main gates off Kaechele Place, which is accessible from Main Street.

The substation access gates will be located such that vehicles entering the site will not impede traffic while unlocking the security gates. UI also will develop an on-site access road (which will loop around the interior of the substation site) to facilitate the movement of maintenance equipment and access to the control enclosure.

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4. EXISTING ENVIRONMENTAL CONDITIONS

This section summarizes the existing environmental conditions at the Project site and in the general vicinity. This information was compiled from published data, including studies conducted of the UI property and Eversource ROW associated with the Project, as well as environmental and land use data maintained by federal, state, and local governments. In addition, UI conducted multiple field investigations of the Project site and consulted with various agencies concerning environmental resources in the vicinity. UI expects to continue such consultations, as needed, as the Project evolves.

In addition to the information included in this section, Appendix A includes an aerial base map that illustrates the existing conditions in the vicinity of the Project. Appendix B includes correspondence from state agencies concerning the Project, while Appendices C, D, E, and F contain the ecological resources, visual resources, cultural resources, and noise reports commissioned by UI to assess the Project site's environmental characteristics.

4.1 TOPOGRAPHY, GEOLOGY, AND SOILS

The Project area is located within the Coastal Lowlands physiographic province. Portions of the Project site, including the existing Old Town Substation and the Eversource ROW that connects to it, have been modified by previous development. However, except for a single home that was built in the mid-20th century and was subsequently demolished and removed, most of the UI property at 312 and 330 Kaechele Place has not been affected by prior land uses and as a result, the topography of the approximately 3-acre property is variable, and generally slopes downward to the northeast. Elevations range from about 240 feet to 200 feet North American Vertical Datum 1988 (NAVD 88).

The U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) identifies soils on most of the Project site, including along the Eversource ROW immediately adjacent to the existing Old Town Substation, as in the Urban Land-Charlton-Chatfield complex, which is characterized as rocky, with 3-15% slopes. The northern portion of the Project site consists of Ridgebury, Leicester, and Whitman soils, which are defined as extremely stony, poorly drained, and very poorly drained (hydric). These soils qualify

as Connecticut wetlands (refer to Section 4.2). The soils map in Appendix C illustrates the locations of the soil types mapped on the Project site. Most of the surficial (unconsolidated) materials are classified as till.[2]

Bedrock in the Project vicinity consists of the Shelton member of the Trap Falls Formation (granitic gneiss)2. Depth to bedrock at the Project site is identified in the Fairfield County soil survey as approximately 29-80 inches.

4.2 WATER RESOURCES AND WATER QUALITY

Surface Water Resources

The City of Bridgeport is located within Connecticut's Southwest Coast Drainage Basin, which includes the Rooster River watershed, an approximately 15.2-square mile area that encompasses urbanized portions of Bridgeport and the towns of Fairfield and Trumbull. The Project site is within the Horse Tavern Brook sub-watershed, which encompasses approximately 5 square miles and is one of six such primary sub-watersheds within the Rooster River watershed. Horse Tavern Brook is located approximately 0.5 mile west of the Project site, west of Main Street (State Route 111). Horse Tavern Brook discharges into the Rooster River approximately 1.5 miles southwest of the Project site, south of State Route 59 in the Town of Fairfield. Lake Forest, a man-made reservoir, is located approximately 0.5 mile southeast of the Project site.

Horse Tavern Brook is designated as a Class A surface water body, pursuant to Connecticut Water Quality Standards (Connecticut General Statutes (C.G.S.) Section 22a-426). Class A surface waters have the following designated uses: potential drinking water supply, fish and wildlife habitat, recreational, agricultural, and industrial supply uses, and other purposes, including navigation.

Both the existing Old Town Substation and proposed substation site, along with the existing and proposed transmission line interconnections along the Eversource ROW, are in uplands. As determined by a review of the NRCS soil survey mapping and on-site field investigations (refer to Appendix C), one inland wetland/watercourse, which encompasses about 0.49 acre, is located on the northern portion of the UI property. This wetland/watercourse meets federal and state jurisdictional criteria and is characterized primarily by forested wetland vegetation. Hydrology associated with this wetland originates from shallow, groundwater seeps, as well as surficial runoff and stormwater from the surrounding developed watershed.

[2] Map Catalog, Connecticut Environmental Conditions Online, accessed September 2019, available at http://www.cteco.uconn.edu.

In addition to the wetland/watercourse identified on the northern portion of the Project site, a wetland/watercourse is located approximately 100 feet southeast of the Project site, within Elton Rogers Woodland Park. This wetland, which is described in the Appendix C report, extends across a portion of the Eversource ROW.

Flood Zones

Based on a review of Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps for Bridgeport (FEMA maps 09001C0426F and 09001C0427F, both dated 6/18/2010), the Project site is not within any mapped FEMA floodplains. Portions of the Eversource ROW to the east of the Project site (within Elton Rogers Woodland Park) encompass small FEMA-designated flood Zone A areas (i.e., floodplains that are mapped but do not have a FEMA-assigned Base Flood Elevation) associated with the Rooster River.

Groundwater Resources, Public Water Supply, and Aquifer Protection Areas

The depth to groundwater in the Project area is estimated at approximately 10 feet below grade. Regional groundwater flows are to the northeast. Based on CT DEEP Groundwater Quality Classification Map data, groundwater in the Project area is classified as GB. Water with a GB classification includes industrial process and cooling waters and base flow for hydraulically connected water bodies. Such water is presumed not suitable for human consumption without treatment. Based on a review of CT DEEP data, no Aquifer Protection Areas or public water supply wells are within 0.5 mile of the Project area.

4.3 BIOLOGICAL RESOURCES

Vegetation

The 0.9-acre existing Old Town Substation site is entirely developed for utility use (i.e., substation equipment within graveled/paved areas) and contains no vegetation other than lawn and ornamental vegetation fronting on Kaechele Place. The adjacent UI properties at 312 and 330 Kaechele Place consist primarily of upland early successional forest (primarily oak, ash, maple, and beech species) with minimal understory. The property at 312 Kaechele Place that was formerly occupied by a residence also includes some scrub-shrub and ornamental vegetation.

A palustrine forested/scrub-shrub deciduous seasonally flooded/saturated wetland (PFO/SS1E) is located along the northern border of the 330 Kaechele Place property. The vegetation community within this

wetland is classified as Red Maple/Skunk Cabbage Seasonally Flooded Forest. Dominant vegetation in this wetland include red maple, green ask, spicebush and skunk cabbage (refer to Appendix C).

Elton Rogers Woodland Park, an undeveloped 73-acre area that borders the UI property to the east and south, consists of a mix of mostly upland forest with a section of forested wetlands. The Eversource 115-kV ROW extends east-west across Elton Rogers Woodland Park.

The Eversource ROW that abuts the existing Old Town Substation to the east (within the park) is characterized by low-growing vegetation (shrubs and herbaceous species) that is compatible with overhead transmission line use. After extending through the exiting Old Town Substation, the Eversource ROW that extends to the west spans paved, developed areas (where vegetation is limited to ornamental vegetation adjacent to roads and parking lots), as well as a small undeveloped area of herbaceous vegetation between Kaechele Place and Main Street.

Wildlife

The wildlife that may inhabit the Project area can be expected to be typical of that found in a mix of forested and residential/commercial urban areas. For example, in the developed suburban/urban areas along Main Street, Kaechele Place, and Sequoia Road, common wildlife may include various birds, nuisance species such as rats and other small rodents; squirrels, and other species common to such developed areas.

In the adjacent Elton Rogers Woodland Park, the undeveloped approximately 3-acre portion of the Project site, and along the Eversource ROW to the east of the existing Old Town Substation, additional wildlife species could occur. Such species may include various birds, mammals such as deer, coyote, and racoon; various reptiles and amphibians, and other species acclimated to suburban/urban areas (refer to Appendix C).

Vernal Pools

A vernal pool survey was conducted to determine whether the wetland/watercourse located on the northern portion of the Project site, as well as the wetland located across the Eversource ROW in Elton Rogers Woodland Park, could meet CT DEEP's definition of a vernal pool (refer to Appendix C). Vernal pools are characterized by appearance, water source, hydroperiod, water quality, and surrounding habitats. Additionally, in order to determine if an area is a functioning vernal pool, an assessment must be performed during amphibian breeding and/or larval development time periods – typically in the spring.

The wetland/watercourse located on the northern portion of the Project area does not provide potential habitat for breeding amphibians due to inadequate hydrology. Thus, no vernal pools are located on the Project site (refer to Appendix C). Similarly, the wetland in Elton Rogers Woodland Park (approximately 100 feet east of the Project site) does not support vernal pool habitat.

State-Listed Threatened, Endangered, or Special Concern Species

Based on review of the CT DEEP Natural Diversity Database (NDDB) map for Bridgeport dated June 2019, no listed threatened, endangered, or special concern species are in the Project area (refer to the NDDB map included in Appendix B). However, UI consulted with CT DEEP NDDB to obtain an assessment of the species that might be present in the Project area. According to the NDDB, the Project area contains known extant populations of a state-listed species of special concern - *Terrapene c. carolina* (eastern box turtle) (refer to CT DEEP NDDB correspondence in Appendix B).

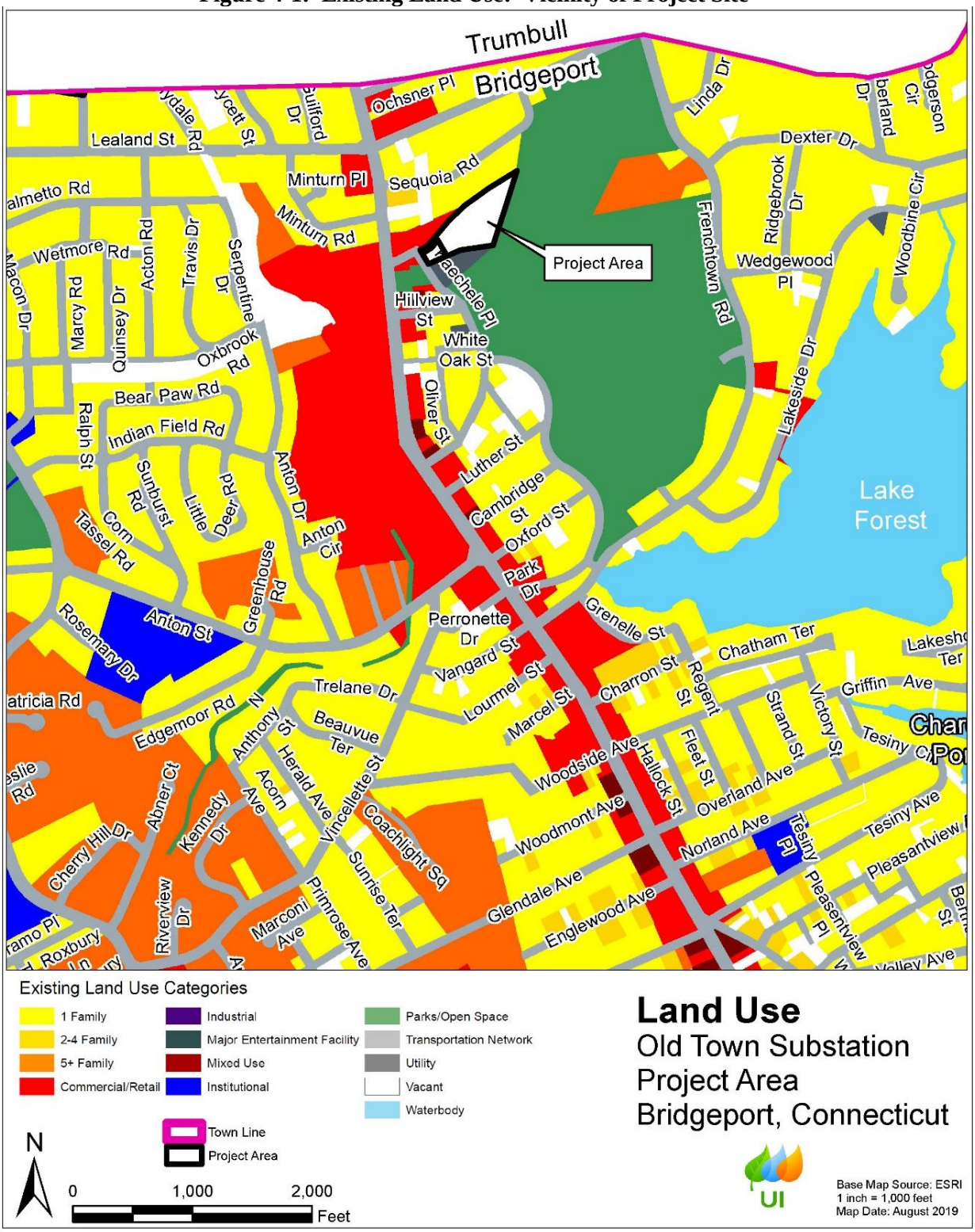
In addition, UI consulted with the U.S. Fish and Wildlife Service (USFWS) regarding the potential for the Project site to include trees that provide suitable summer roosting habitat for the federally listed threatened Northern Long-Eared Bat. The USFWS indicated that no habitat for federally listed species occurs in the Project area (refer to USFWS correspondence in Appendix B). However, based on the results of the ecological assessment performed of the Project site, three to five viable Northern Long-Eared Bat roosting trees were identified on the Project site (refer to Appendix C). In the unlikely event that Northern Long-Eared Bats use the trees at the Project site as roosting or nursery habitat, UI has agreed to limit clearing activities to occur outside of the pup season (June 1 to July 31).

4.4 LAND USE, RECREATION, AND COMMUNITY FACILITIES

Existing Land Use and Zoning

The Project is in the northwestern portion of Bridgeport, in the city's North End neighborhood, an area historically used and zoned primarily for residential and commercial purposes. Currently, commercial development, including professional offices and retail, is centered along Main Street and institutional and open space uses are scattered throughout the area (refer to Figure 4-1). The North End consists of approximately 675 acres and is bounded on the south by the city's Brooklawn/St. Vincent's neighborhood, on the east by the Reservoir neighborhood, on the north by the Town of Trumbull, and on the west by the Town of Fairfield.

Figure 4-1: Existing Land Use: Vicinity of Project Site



Source: Excerpted from City of Bridgeport Existing Land Use Map (2018)

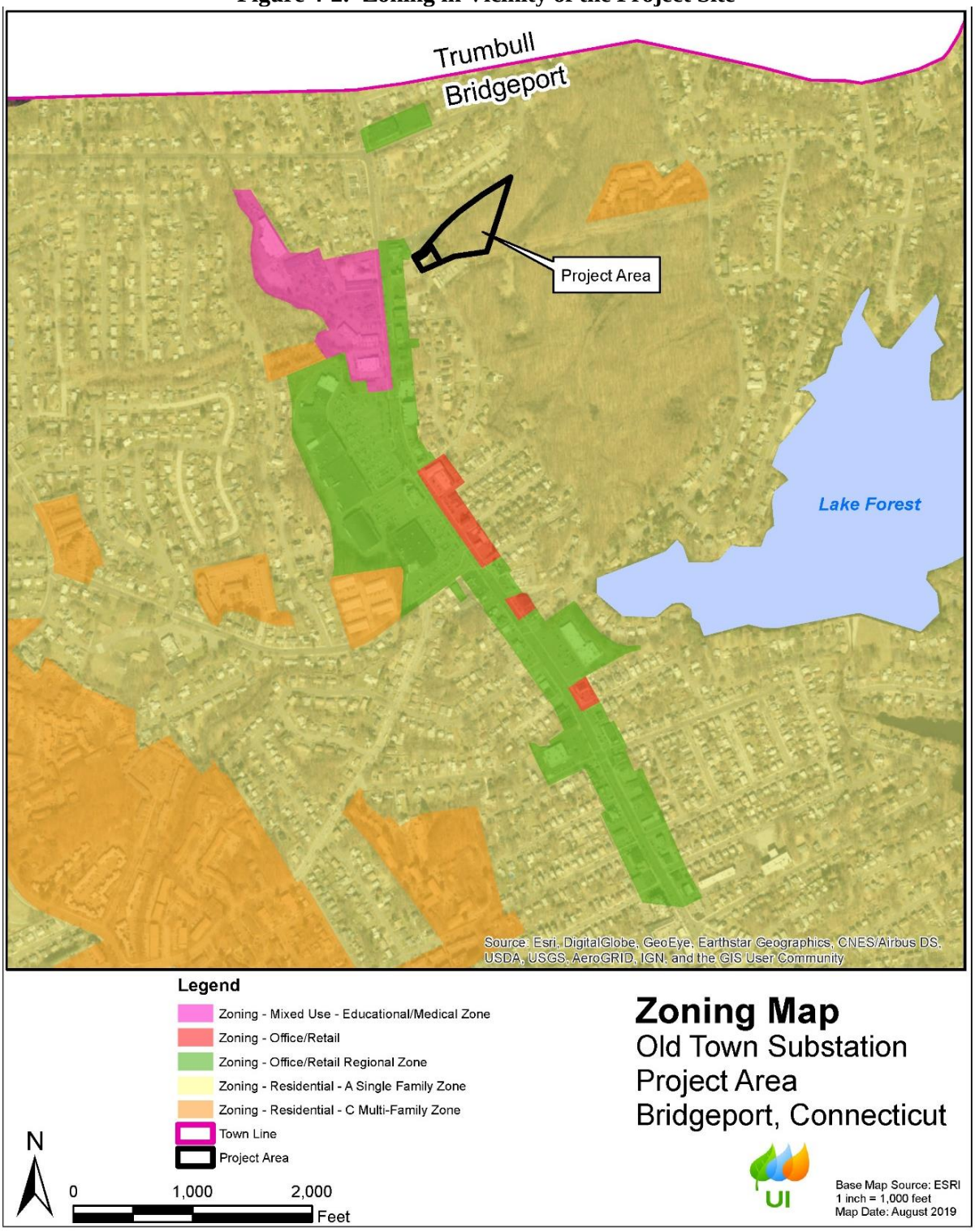
As illustrated in Figure 4-1 and the Appendix A aerial-based map, lands in the vicinity of the Project site consist of a mix of commercial uses along Main Street, utility uses (including the existing Old Town Substation and the Eversource ROW that extends through the substation), undeveloped open space (the Elton Rogers Woodland Park), and residential uses to the south along Kaechele Place and to the north along Sequoia Road. A variety of densely developed commercial uses are situated along Main Street (State Route 111), west of the Project site. Such uses include medical offices (Yale New Haven Health, Commerce Park Dental), retail facilities (Michaels Craft Store, Stop & Shop, Petco, Marshalls), and professional offices.

Commercial uses in the immediate vicinity of the Project site include the Commerce Hill Funeral Home, which abuts the site to the north and west, as well as Andy and T Nail Spa and Labco, which have back parking lots that extend to Kaechele Place. Elton Rogers Woodland Park occupies approximately 73 acres, abutting and to the east of the existing Old Town Substation and the UI property at 312 and 330 Kaechele Place. Access to the park is via Frenchtown Road. The Westfield Trumbull Mall is located approximately 0.5 mile north of the Project site, west of Main Street in Trumbull.

Single-family residential uses are located southwest of the Project site along Kaechele Place, Hillview Street, and White Oak Street, as well as to the north along Sequoia Road. The Green Tree townhouse / condominium development is situated approximately 0.2 mile to the east of the Project site, east of Elton Rogers Woodland Park, along Frenchtown Road. Lake Forest, a man-made lake, is located approximately 0.5 mile southeast of the Project site, east of Elton Rogers Woodland Park. Lake Forest is bordered by private residences.

According to Bridgeport's 2018 Zoning Map, lands in the vicinity of the Project area, including the existing Old Town Substation and the proposed Project site, are zoned for residential (R-A) use (refer to Figure 4-2). However, areas along Main Street are zoned predominantly for office/retail regional zone (OR-R) use, with some mixed use – educational medical (ME-EM) areas.

Figure 4-2: Zoning in Vicinity of the Project Site



Source: Excerpted from City of Bridgeport Zoning Map, June 25, 2018.

Recreation

Except for the Elton Rogers Woodland Park, which abuts the Project site to the east and south, there are no public recreational areas within 2,000 feet of the Project site. The undeveloped park is forested and is accessible to the public only via a small, unimproved parking area located off Frenchtown Road. The park includes hiking trails, but no other recreational facilities. Eversource's existing 115-kV transmission line ROW, which is managed in low-growth vegetation consistent with the operation of such overhead electric lines, extends east-west through the park. The utility ROW has extended through the area for many years, pre-dating the creation of the park.

Land Use Plans

As the central planning document for the city, *Plan Bridgeport (the City's Plan of Conservation and Development* (April 2019) focuses on four major themes relating to the municipality's physical form, economic and social health, and quality of life. These themes include waterfront redevelopment, transit-oriented development, neighborhood strengthening, and creating conditions for increased residential development.

Plan Bridgeport does not specifically address utility infrastructure improvements, but notes the importance of attracting economic development, including reducing the tax burden on residents by growing the municipal Grand List and encouraging the development of vacant or underutilized properties. The plan also identifies a goal of promoting the growth of the energy industry in Bridgeport, with a focus on green energy generation and support for such energy.

Connecticut's revised draft *Conservation & Development Policies Plan 2018-2023* (March 2019) identifies the Project area as north and west of Bridgeport's Regional Center. The Plan advocates redeveloping and revitalizing regional centers with existing or currently planned physical infrastructure (Growth Management Principle #1).

As identified in the Plan, the Project site is within a neighborhood conservation area; Elton Rogers Woodland Park is shown as within a preservation zone, while a conservation zone is identified along Horse Tavern Brook and its tributaries. The latest revision to the Plan, which is currently pending review by the Connecticut General Assembly, identifies most of Bridgeport as a priority funding area for various development.

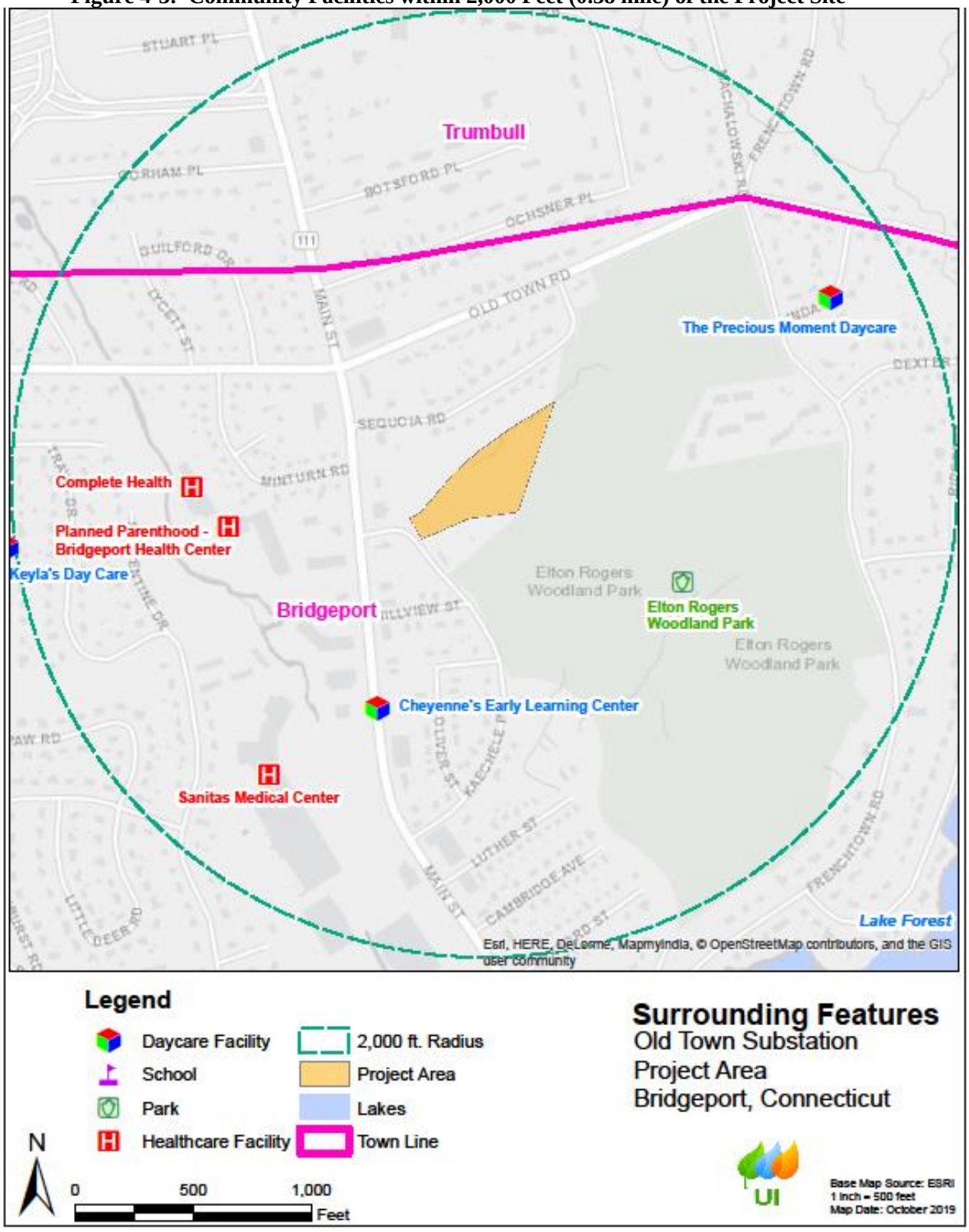
Community Facilities

The community facilities (daycare facilities, community centers, senior centers, hospitals, schools, recreational areas, and youth camps) within 2,000 feet of the Project area (all located in Bridgeport) are listed in Table 4-1 and illustrated on Figure 4-3.

Table 4-1: List of Community Facilities within 2,000 Feet (0.38 mile) of Project Area

Community Facility Type/Name	Address	Distance from Proposed Project Site (miles, direction)
Medical Facilities		
Planned Parenthood – Bridgeport Health Center	4697 Main Street	0.28 mile, W
Complete Health	4699 Main Street	0.28 mile, W
Sanitas Medical Center	451 Main Street	0.27 mile, SW
Daycare Facilities		
The Precious Moment Daycare	36 Linda Drive	0.31 mile, NE
Cheyenne's Early Learning Center	4600 Main Street	0.15 mile, SW
Keyla's Day Care	108 Acton Road	0.34 mile, W
Recreational Areas/Parks		
Elton Rogers Woodland Park	West of Frenchtown Road	Adjacent

Figure 4-3: Community Facilities within 2,000 Feet (0.38 mile) of the Project Site



4.5 VISUAL AND AESTHETIC CHARACTERISTICS

In the immediate vicinity of the Project site, the visual environment is characterized by the existing Old Town Substation, the Eversource 115-kV transmission line ROW and lattice steel structures, and a variety of different types of commercial buildings clustered along Main Street, including the funeral home and its parking lot that abut the UI property to the northwest. Single-family residential areas along Sequoia Road back up to the forested areas on the northern portion of UI's property, as well as the funeral home parking lot.

Elton Rogers Woodland Park, located to the south and east of the site, is undeveloped and includes hiking trails. However, there are no identified scenic vistas within the park, which is traversed by an Eversource transmission line ROW.[3]

Because of the mix of commercial, residential, and utility uses, the Project area has no special visual characteristics. Further, there are no publicly designated scenic vistas located near the Project site.

Figure 4-4 provides a representative aerial view of the Project site and immediate vicinity. Refer also to the *Preliminary Visual Assessment and Photo-Simulations* (Appendix D).

4.6 TRANSPORTATION AND UTILITIES

Bridgeport has a well-developed transportation network and is served by a full complement of utilities (electric, natural gas, sewers, public water, telephone, cable). The primary transportation routes in the vicinity of the Project are the Merritt Parkway (State Route 15) and Main Street (State Route 111); local roads such as Old Town Road and Kaechele Place also provide access to the site. Greater Bridgeport Transit provides bus service along both Main Street and Old Town Road.

No airports are in the immediate Project area. The nearest airport is Sikorsky Memorial Airport, a general aviation facility owned by Bridgeport that is situated approximately 6 miles to the southeast, adjacent to Long Island Sound in the Town of Stratford.

[3] Along State Route 111, there are no scenic land strips, as designated by the Connecticut Department of Transportation (CT DOT). (Such lands are roadside properties, located primarily outside of highway ROWs, that were purchased at least in part with 1965 federal Highway Beautification Act funds in order to control the development of billboards and other unsightly views along highways.

Figure 4-4: Representative View of Existing Old Town Substation, UI Property, Eversource ROW, and Immediate Vicinity (View to the East)

Nearby transmission facilities include the two Eversource 115-kV lines that connect to the existing Old Town Substation, as well as the additional 115-kV line that presently passes through the substation. In addition, 13.8-kV lines link the existing Old Town Substation to UI's distribution system.

The existing Old Town Substation is not connected to municipal sewers, but rather has a septic system. The station is connected to the Aquarion Water Company public water system.

4.7 CULTURAL (ARCHAEOLOGICAL AND HISTORIC) RESOURCES

To assess the potential sensitivity of the Project area for the location of archaeological resources and to identify any known archaeological and historic sites in the vicinity, UI initially commissioned Heritage Consultants LLC (Heritage) to perform a cultural resource review of the proposed Project site and vicinity. Subsequently, Fitzgerald & Halliday conducted additional studies of the Project's Area of Potential Effect (APE)[4] and of the potential historic resources in the Project area. These cultural resource reports are included in Appendix E.

Both studies reviewed records maintained by the SHPO, as well as historical mapping, historic aerial photography, and GIS data. These analyses determined that the APE for Direct Effects is limited to the area where construction and construction-related activities will occur for the development of the Project. In comparison, the APE for Visual Effects includes a wider area, but due to the presence of mature trees and extensive building development, is restricted to certain locations along Kaechele Place, Hillview Street, and Main Street. Although the actual viewshed of the Project will be limited, standing structures within a 0.25-mile radius of the Project site were investigated to assess their potential eligibility for listing on the National or State Registers of Historic Places (NRHP/SRHP).

The cultural resource studies found no structures or archaeological sites listed on or eligible for the NRHP/SRHP within 0.25 mile of the Project site. Further, due to the past modifications on the existing Old Town Substation site and Eversource ROW, as well as the variable topography and previous residential development on UI's adjacent approximately 3-arce parcel, the Project site was identified as not sensitive for the location of buried archaeological sites.

[4] Pursuant to the National Historic Preservation Act (36 CFR 800.16[d]), the APE refers to the geographic area within which a project may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist. The APE is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking. Direct impacts would result from ground disturbance, whereas indirect effects may involve change in the visual environment and context of standing historic structures.

In November 2019, UI submitted the cultural resources reports, along with a "Project Review Cover Form" to the Connecticut SHPO, seeking the SHPO's concurrence with Heritage's findings (refer to Appendix E). The SHPO review of this information is pending.

4.8 AIR QUALITY, NOISE, AND LIGHTING

Air Quality

Ambient air quality is affected by emissions from mobile sources (e.g., vehicles) and stationary sources (e.g., manufacturing facilities, gasoline stations, power plants). Naturally occurring pollutants, such as radon gas, also affect air quality. Ambient air quality in Connecticut is monitored by CT DEEP and air quality conditions are assessed based on compliance with the National Ambient Air Quality Standards (NAAQS) for six criteria pollutants (sulfur dioxide, carbon monoxide, nitrogen dioxide, particulate matter, lead, and ozone).

The state is in attainment for all criteria pollutants except ozone. CT DEEP data shows that measured ozone levels in southern Connecticut (Fairfield, New Haven, and Middlesex counties) exceed the NAAQS on several days each summer, depending on weather conditions. Ambient air quality in the Project area can generally be expected to mirror these conditions in the state as a whole.

Noise

Existing noise levels in the Project area are representative of a developed urban/suburban setting and are particularly influenced by commercial uses and traffic along Main Street. Table 4-2 lists the typical sound levels associated with different types of land use conditions and activities, as defined by sound pressure level (decibels on the A-weight scale [dbA] – an expression of the relative loudness of sounds in air as perceived by the human ear).

Both the Bridgeport Noise Ordinance and Connecticut noise regulations (RCSA §§ 22a-69-1 to 22a-69-7.4, 2015) prescribe the same A-weighted maximum sound pressure levels, based on land use at the noise emitter and receptor. These regulations define daytime vs. nighttime noise periods, classify noise zones based on land uses, and identify noise standards for each zone, specifying that noise emitters must not cause the emission of excessive noise beyond the boundaries of their noise zone so as to exceed the allowable noise levels on a receptor's land.

Table 4-2: Typical Noise Levels Associated with Different Indoor and Outdoor Activities

SOUND PRESSURE LEVEL, dBA	SUBJECTIVE EVALUATION	COMMON OUTDOOR ENVIRONMENT OR SOURCE	COMMON INDOOR ENVIRONMENT OR SOURCE
140	Deafening	Jet aircraft at 75 ft	
130	Threshold of pain	Jet aircraft during takeoff at a distance of 300 ft	
120	Threshold of feeling	Elevated train	Hard rock band
110	Extremely loud	Jet flyover at 1000 ft	Inside propeller plane
100	Very loud	Power mower, motorcycle at 25 ft, auto horn at 10 ft	
90	Very loud	Propeller plane flyover at 1000 ft, noisy urban street	Full symphony or band, food blender, noisy factory
80	Moderately loud	Diesel truck (40 mph) at 50 ft	Inside auto at high speed, garbage disposal, dishwasher
70	Loud	B-757 cabin during flight	Close conversation, vacuum cleaner, electric typewriter
60	Moderate	Air-conditioner condenser at 15 ft, near highway traffic	General office
50	Quiet		Private office
40	Quiet	Farm field with light breeze, birdcalls	Soft stereo music in residence
30	Very quiet	Quiet residential neighborhood	Bedroom, average residence (without TV and stereo)
20	Just audible		Human breathing
10	Threshold of hearing		
0			

Source: Adapted by Black & Veatch from *Architectural Acoustics*, by David M. Egan (1988) and *Architectural Graphic Standards*, by Ramsey and Sleeper (1994).

Table 4-3 lists the City and Connecticut noise zone standards, by emitter (source) and receptor (receiver) noise classification. The existing Old Town Substation is considered an industrial emitter, as will be the proposed substation.

Table 4-3: State of Connecticut and City of Bridgeport: Maximum Sound Pressure Level Noise-Control Levels (By Emitter and Receptor Land Use)

Noise Emitter Land Use	Noise Receptor Land Use			
	Industrial	Commercial	Residential (Day)	Residential (Night)
Residential	62 dBA	55 dBA	55 dBA	45 dBA
Commercial	62 dBA	62 dBA	55 dBA	45 dBA
Industrial	70 dBA	66 dBA	61 dBA	51 dBA

Notes:
The State of Connecticut defines "day" as the hours from 7:00 AM to 10:00 PM, and night from 10:00 PM to 7:00 AM all days of the week. Bridgeport defines "day" as the hours from 7:00 AM to 6:00 PM, and night from 6:00 PM to 7:00 AM, Monday through Friday. On Saturday and Sunday, the City defines "day" as from 9:00 AM to 6:00 PM, and night from 6:00 PM to 9:00 AM.

To define baseline ambient noise levels specific to the Project site, UI commissioned a noise study (refer to Appendix F). As part of this study, sound measurements were taken at four publicly accessible sites (e.g., along sidewalks or road shoulders) in the vicinity of the Project site:

1. Along Sequoia Road to the north of the site;

2. At the Greentree townhomes on Frenchtown Road, approximately 0.2 mile west of the site;

3. Along Kaechele Place, behind Hillview Street south of the existing Old Town Substation; and

4. At the corner of Main Street and Minturn Road, approximately 0.1 mile northwest of the site.

At each of the four locations, both daytime and nighttime noise levels were measured for approximately 20-30 minutes.

This ambient noise study demonstrated that at the area in the vicinity of the Project site is considered to have high background (ambient) noise, influenced primarily by traffic movements (especially along Main Street), aircraft, insects, and lawn equipment. Short-term ambient daytime noise levels ranged

from about 46 to 64 dBA, while nighttime ambient noise levels were between 42 and 58 dBA[5]. At one of the sites (Main Street and Minturn Road), the existing ambient sound levels currently exceed both the daytime and nighttime limits for residential areas; the primary noise source is traffic.

In addition to the short-term measurement sites, UI also performed long-term (24 hour) noise measurements along the Project site's northern property line, south of the boundary with residences at 60 and 76 Sequoia Road. As described in Appendix F, these measurements were taken in August 2019. The purpose of these measurements was to document existing ambient sound levels at the closest residential properties to the Project site, including any noise influence from the operation of the transformers at the existing Old Town Substation.

Lighting

The Project site is bordered to the west by an urbanized area that is characterized by a variety of lighting sources from the surrounding commercial and professional uses, as well as by municipal street lighting and commercial signs. To the east, the Project site is bordered by Elton Rogers Woodland Park and the Eversource ROW, where there are no lighting sources. Residences located along Sequoia Road (to the north) and Kaechele Place and Hillside Drive (to the south and southwest) include lighting sources common to such areas.

[5] These measurements reflect "filtered" sound levels, expressed in Leq (dBA), for each site. The levels were "filtered" to eliminate atypical sounds, such as wind-induced noise, insect noise, etc., and thereby to allow a better comparison of noise levels. (Leq, or equivalent sound level, is the preferred method to describe sound levels that vary over time, resulting in a single decibel value that considers the total sound energy over the time period of interest.)

5. POTENTIAL ENVIRONMENTAL EFFECTS AND MITIGATION MEASURES

The Project will be consistent with the long-established utility uses on the Project site and in the vicinity (i.e., the existing Old Town Substation and Eversource ROW) and will have a positive long-term effect on the reliability of the electric system. The rebuilt Old Town Substation and associated 115-kV line interconnections will be located entirely on UI property or within Eversource's ROW, in upland areas, with the exception of the approximately 0.15-acre easement that will be required on City of Bridgeport property in order to accommodate the overhead transmission line connections to the new substation.

Although the construction and operation of the Project will require the conversion of approximately 1.35 acres of forest land to utility purposes, the Project will be consistent with the adjacent utility uses and will not result in any expansion of the Eversource ROW. The Project will require a small easement (approximately 0.15-acre) on Bridgeport's property within Elton Rogers Woodland Park, but will not affect the overall passive (e.g., hiking) recreational use of the park and will be consistent with the Eversource ROW, which has extended through the area for decades. As a result, environmental effects are expected to be minor and highly localized to the Project vicinity. UI will mitigate such impacts to the extent practical by implementing standard construction best management practices and conforming to the conditions of Project permits and approvals.

The anticipated impacts and proposed mitigation measures identified in this section are based on UI's experience in constructing, operating, and maintaining substations and associated electric transmission and distribution connections, as well as on the results of the Project-specific environmental studies, engineering and constructability reviews, and agency consultations conducted to date. Additional measures to avoid or minimize environmental effects may be identified as part of the ongoing engineering design and constructability reviews, the Council's Application review process, and further consultations with the municipalities and/or regulatory agencies.

5.1 TOPOGRAPHY AND GEOLOGY

The Project will not affect geological conditions and will have only highly localized effects on topography. Specifically, the construction of the Project will involve both grading and filling to create a level area as required for the development of the new substation, including the installation of substation equipment.

These activities will result in long-term topographic modifications to the site. To minimize the amount of grading and filling required, UI proposes to install a retaining wall along the northern, and southern eastern portions of the substation perimeter. An existing retaining wall, located along the current Old Town Substation's southern perimeter, is expected to be replaced. Appendix A includes a preliminary the site plan for the new substation.

5.2 SOILS, GROUNDWATER, AND STORMWATER MANAGEMENT

Soils, groundwater, and stormwater will be managed appropriately during the construction of the Project. Further, as part of the design of the new Old Town Substation, UI will incorporate engineering controls to manage stormwater runoff during the operation of the facility and will conform to the CT DEEP requirements for stormwater management pursuant to the *General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities* (General Permit). Pursuant to the General Permit, UI will prepare a Project-specific SWPCP.

During Project construction, in addition to the topographic modifications to the proposed substation site, certain work activities will disturb soils. Groundwater also could be encountered in the excavations for the Project facilities. Appropriate erosion and sedimentation controls, as well as dewatering protocols, will be implemented as needed, consistent with the Project SWPCP and General Permit.

Construction activities that will disturb soils include site preparation work such as grading, filling, and the installation of the retaining wall, as well as excavations required to install foundations for the substation enclosures, equipment, and overhead transmission line structures. Soils will be pre-characterized and subsequently managed in accordance with CT DEEP solid waste regulations and UI requirements. Certain soils excavated during Project construction may be removed from the Project area and properly managed or disposed of off-site. UI will adhere to state and federal requirements for the disposal of contaminated soils, if any are encountered during construction.

Contaminated groundwater, if any, encountered during Project construction will be managed in accordance with applicable CT DEEP requirements. For example, prior to discharge, the groundwater may be pumped

into an appropriate treatment system, which may include a fractionization (frac) tank, a series of bag filters, and/or carbon vessels. Specific measures will be further identified in the D&M Plan.

Sediment and erosion controls commonly used during construction activities include hay/straw bales, silt fence, straw wattles, diversion swales, track pads, hay bale corrals for management of spoils or concrete washout areas, and erosion control blankets. UI will routinely perform monitoring and inspections to verify the effectiveness of the erosion and sedimentation controls and will modify such measures as required during different construction phases.

5.3 WATER RESOURCES AND WATER QUALITY

The Project is not expected to directly affect inland water resources or water quality and is not located near any designated aquifer protection areas or FEMA-designated floodplains. Based on the Project planning conducted to date, UI does not anticipate that permanent fill will be placed in the approximately 0.49-acre wetland located along the northern boundary of the Project site.

However, as more detailed designs are developed for the rebuilt substation, it is possible that some vegetation may have to be cut in the wetland and that some construction activities, particularly the installation of the retaining wall, may have to be performed from temporary construction matting placed in the western portion of the wetland. If temporary work in the wetland is required, UI will consult with and provide appropriate submittals to the CT DEEP and USACE. Similarly, if, based on final project plans, a portion of the wetland must be unavoidably filled to develop the new substation, UI will consult with and obtain appropriate permits from the CT DEEP and USACE.

During the construction of the Project, UI will implement measures to minimize the potential for runoff into municipal sewers and to protect water resources in the Project vicinity (e.g., nearby wetlands and streams). Accordingly, UI will install erosion and sediment controls and will perform environmental inspections, pursuant to the SWPCP and the *General Permit*.

The new substation will have no appreciable increase in impervious surface and thus will create no additional burden for municipal stormwater management.

5.4 SPILL PREVENTION AND CONTROL

UI will require its contractors to adhere to spill prevention and control protocols during Project construction. Such protocols may include maintaining adequate spill kits on site and assuring that contractor personnel

are aware of the proper procedures for promptly containing, cleaning up, and disposing of spilled materials, as well as for reporting spills to the CT DEEP Emergency Response Unit. As part of the decommissioning of the existing Old Town Substation, UI will properly remove and dispose of all equipment and fluids.
For the operation of the new substation, UI will develop and implement a *Spill Prevention Control and Countermeasures (SPCC) Plan*. The SPCC Plan will include, but will not be limited to, mitigation measures to be used during facility operation (secondary containment, audio/visual alarms, etc.), environmental emergency contacts, and oil-filled equipment inspections.

5.5 BIOLOGICAL RESOURCES

General

For the construction of the Project, all existing vegetation within the footprint of the proposed substation facilities will be removed. The forested vegetation that currently characterizes most of the undeveloped portion of the Project site will be replaced by the substation yard, and the wildlife species that presently use the site will be displaced.

In addition, vegetation will be affected on the portion of the Eversource ROW where the existing 115-kV lattice steel tower will be replaced with two monopoles. The vegetation within the Eversource ROW consists of herbaceous or scrub-shrub species, consistent with Eversource's ROW management protocols for vegetation clearances from overhead transmission lines. For the Project, such vegetation will be cut or mowed as needed to allow for construction access and work pads near the existing and proposed transmission structure sites. In addition, some trees or tree branches will likely have to be trimmed or cut along Eversource's existing off-ROW access road that extends from Kaechele Place to the lattice steel tower.

Further, to extend the 115-kV transmission lines from the Eversource ROW into the new substation, tall woody vegetation within an approximately 0.15-acre area on municipal property (within Elton Rogers Woodland Park) will have to be removed in order to provide appropriate clearance from the overhead lines. Therefore, in this easement area, existing upland forest will be converted to vegetation, like that found on the adjacent Eversource ROW.

The development of the new substation also will represent a long-term conversion of approximately 1.35 acres for forest land to utility purposes. The remainder of UI's property adjacent to the existing Old Town Substation is not expected to be affected by the Project and will remain as forest land.

Overall, the impacts of the Project on vegetation and wildlife will be minor. Other forest, herbaceous, and scrub-shrub communities are present in the vicinity of the Project site and can be expected to provide habitat for any displaced wildlife species. As a result, while the development of the substation will represent a long-term change in on-site vegetation, the overall effect will be minor and localized.

State-Listed Threatened, Endangered, or Special Concern Species

UI will implement measures to protect the species identified by the CT DEEP NDDB and the USFWS as potentially inhabiting the Project site. Specifically, to avoid impacts to bats, UI will not cut trees on the Project site during the NLEB maternity roosting season, which is from June 1 to July 31. Similarly, to avoid or minimize the potential for adverse impacts to the Eastern Box turtle, UI will implement the NDDB's recommended protection strategies, as detailed in the NDDB's October 18, 2019 correspondence (refer to Appendix B).

Based on consultations with CT DEEP NDDB, there are potential populations of state-listed species of special concern *Terrapene c. carolina* (eastern box turtle) in the vicinity of the Project site (refer to Appendix B). CT DEEP indicated that eastern box turtles typically inhabit old fields and deciduous forests, which may include transmission lines and logged woodlands, and are often found near small streams and ponds. The turtles are active between April 1 and October 30; accordingly, CT DEEP advised UI to conduct land clearing during this time period while the turtle is active to allow the animal to move out of harm's way and minimize mortality to hibernating individuals. Given the known extant populations of eastern box turtles in the vicinity of the Project site, during construction UI will implement the following best management practices as recommended by CT DEEP in their NDDB letter:

- Hire a qualified herpetologist to be at the Project area to ensure that protection guidelines remain in effect and to prevent turtles from being run over when moving heavy equipment. Having a qualified herpetologist at the Project area in the month of June when turtles are selecting nesting sites will be especially important.

- Exclusionary practices will be implemented to prevent any turtle access into construction areas. These measures will be installed at the limits of disturbance.

- Exclusionary fencing will be at least 20 inches tall and will be secured to and remain in contact with the ground and be regularly maintained (at least bi-weekly and after major weather events) to secure any gaps or openings at ground level that may let turtles pass through. Plastic or netted silt-fence will not be used.

- All staging and storage areas, outside of previously paved locations, will be reviewed to remove individual turtles and exclude them from re-entry.

- All construction personnel working within the turtle habitat will be apprised of the species description and the possible presence of a listed species and instructed to relocate turtles found inside work areas or notify the appropriate authorities to relocate individuals.

- Any turtles encountered within the immediate work area will be carefully moved to an adjacent area outside of the excluded area, and fencing will be inspected to identify and remove access point.

- In area where silt fence is used for exclusion, it will be removed as soon as the area is stable to allow for reptile and amphibian passage to resume.

- No heavy machinery or vehicles will be parked in any turtle habitat.

- Special precautions will be taken to avoid degradation of wetland habitats, including any wet meadows and seasonal pools.

- The contractor and consulting herpetologist will search the work area each morning prior to any work being done.

- When felling trees adjacent to brooks and streams, the contractor will cut them to fall away from the waterway and will not drag trees across the waterway or remove stumps from banks.

- The contractor will avoid and limit any equipment use within 50 feet of streams and brooks.

- Any confirmed sightings of box, wood, or spotted turtles will be reported and documented with the NDDB on the appropriate special animal form found on CT DEEP's website.

5.6 LAND USE, RECREATION, AND COMMUNITY FACILITIES

The Project will represent an extension of UI's long-standing use of property along Kaechele Place for utility purposes. The new substation will encompass the existing Old Town Substation site and will be aligned to best interconnect with the long-established Eversource ROW that traverses UI's property. The Project will be consistent with existing and future land use plans for maintaining and upgrading infrastructure as needed for Bridgeport to grow as a regional center and will provide needed reliability to the regional electric system, to the benefit of UI customers and others.

The Project will have no adverse effect on community facilities and services or developed recreational areas. The approximately 0.15-acre easement required adjacent to UI's property and the Eversource ROW for the proposed 115-kV overhead transmission line connections to the new substation, although within Elton Rogers Woodland Park, will not preclude continued recreational use of the area. Further, the use of this small easement area to provide clearance for the overhead transmission lines will be consistent with the Eversource ROW that presently extends through the park.

5.7 VISUAL AND AESTHETIC CHARACTERISTICS

To evaluate the potential views of the Project from nearby locations, UI completed a Preliminary *Visibility Assessment*, which is provided in Appendix D. This analysis incorporated a combination of field evaluations and three-dimensional computer modeling to portray scaled renderings of the rebuilt substation and associated overhead 115-kV line connections. Figure 5-1 provides a photographic simulation of the new Old Town Substation in relation to surrounding land uses; Appendix D includes additional information about the visual resources review.

The *Preliminary Visibility Assessment* shows that the Project will only have a localized effect on views. The rebuilt substation will be visible from nearby locations along Kaechele Place. In addition, in the winter (under leaf off conditions), the rebuilt substation will be more visible from some residences along Sequoia Road. However, UI intends to retain as much as possible of the existing vegetation (trees and shrubs) along the northeastern portion of its property, and this buffer is expected to provide natural screening.

Within the Eversource ROW, the removal of the existing 105-foot-tall lattice steel towers also will represent a change in the localized visual environment. The new steel monopoles are expected to be no taller than the existing lattice steel towers.

Overall, the extensive nearby commercial developments and forest cover will serve to obstruct most views of the new substation.

Figure 5-1: Photo simulation of Proposed Old Town Substation (Fence with Screening) and Vicinity (View to East, Existing Old Town Substation Removed)

5.8 TRANSPORTATION AND UTILITIES

The construction and operation of the proposed Project will not result in any significant adverse effects on transportation or municipal utility systems. Moreover, the Project will have a positive effect on the reliability of the state and regional electric systems, particularly the distribution system in the greater Bridgeport area.

The Project area is readily accessible from the local and regional highway network. Access for construction will be via local roads, including Main Street (State Route 111) and Kaechele Place. Some construction activities could result in minor and short-term effects to vehicular traffic on the local roads leading to the Project area. For example, localized traffic congestion may occur when heavy construction equipment or large components are transported to the work site, when construction personnel travel to and from the Project site, and when the work is performed along the Eversource ROW to connect the overhead 115-kV lines to the new substation and to remove the existing 115-kV connections to the old substation. However, these effects will be minor and short-term. To the extent practical, UI will coordinate work to minimize potential impacts to traffic on local roads and on State Route 111.

The Project area also is served by public water, sewer, and storm sewer systems, as well as other utilities. The Project will not affect any above-grade existing municipal utilities. UI will coordinate with the City of Bridgeport regarding other municipal utilities and will design the Project to avoid impacts to existing utility systems.

The operation of the substation will not require full-time on-site personnel and thus will not result in any long-term effects on traffic.

5.9 CULTURAL (ARCHAEOLOGICAL AND HISTORIC) RESOURCES

The Project is not expected to result in any adverse effects to known cultural (archaeological or historic) resources. As documented in the cultural resource studies (refer to Appendix E), the site does not encompass and is not located near any archaeological sites or historic structures listed on the NRHP/SRHP. Similarly, due to the varied topography of the presently undeveloped UI property and the historical modifications to the existing Old Town Substation property and the Eversource ROW, the Project site is not considered archaeologic sensitive.

Although unlikely, buried archaeological materials could be encountered during excavation activities performed during Project construction. To address this contingency, UI will include in the Project D&M

Plan protocols for implementation if unanticipated cultural materials are unearthed during construction. UI's civil contractor will be briefed on such protocols.

5.10 AIR QUALITY, NOISE, AND LIGHTING

The construction and operation of the Project will have minimal and highly localized effects on air quality, noise, and lighting.

Air Quality

The development of the Project will result in short-term and localized effects on air quality as a result of emissions from construction equipment and vehicles, as well as from fugitive dust emissions generated during earth-moving activities. The operation of the Project facilities will not result in adverse impacts to air quality.

To minimize emissions from construction equipment and vehicles, UI will require Project contractors to properly maintain equipment and to adhere to Connecticut's anti-idling requirements (RCSA § 22a-174-18). In addition, UI will require its contractors to control dust emissions by applying water or equivalent substances to exposed soils on the site, as necessary, per guidance provided in the SWPCP. To minimize tracking of dirt from Project construction areas onto Kaechele Place (and other paved roads, if used for construction access), UI will install anti-tracking pads, and observe a sweeping protocol at entrances to the Project site.

Noise

The construction of the Project will result in minor and highly localized increases in noise associated with construction activities, such as the operation of equipment, the excavations for foundations and cable trenches, and the installation of the substation and transmission line facilities. However, because the proposed Project facilities are near commercial areas along Main Street, the temporary increases in sound levels are expected to be generally consistent with the existing ambient conditions.

There are no schools, places of worship, or other community facilities in the immediate vicinity of the Project site, although construction noise may be apparent from residences to the north along Sequoia Road and to the west and southwest (along Kaechele Place and other streets). However, typical construction activities are expected to occur during daylight hours, between 7:00 AM and 7:00 PM, Monday to Saturday, when human sensitivity to noise is typically less than during the nighttime.

Like the existing Old Town Substation, the primary noise sources associated with the operation of the new substation will be the two 115/13.8-kV transformers. Other substation equipment and the 115-kV lines will not produce noise.

As described in detail in Appendix F, a computerized noise model, using input regarding the existing noise environment in the vicinity of the Project site and the anticipated transformer noise from the new substation, was used to predict the effect of the new substation on ambient sound levels at the receptor locations identified in Section 4.10.

The noise analysis demonstrates that the sound from the new substation is predicted to be within allowable state and municipal sound limits at each of the receptor locations. Predicted noise levels from the two transformers are expected to be within the allowable sound level limits for adjacent land uses in the surrounding community and at the UI property line. When considered in the context of existing ambient sound levels, under certain conditions, the transformers may produce tones as defined by the CT DEEP noise regulations at sites to the north of the Project along Sequoia Road and to the west at the closest residence on Kaechele Place. However, the presence of the tones is not considered excessive noise as the overall A-weighted levels from the transformers at these locations are more than 5 dB below the noise zone standards established by the regulation.

Lighting

The Project is located immediately east of a developed urban area that is well-lit due to existing commercial facilities and nearby transportation network. As a result, the construction and operation of the Project will result in only localized and minor modifications to the lighting environment.

The construction of the Project facilities will typically occur during the daytime, when artificial lighting will not be required. If certain construction activities must be performed during night-time (e.g., to adhere to outage requirements), temporary lighting will be positioned to focus illumination on work areas. Such temporary lighting will not affect areas outside the general vicinity of the Project site.

At the new Old Town Substation, low-level lighting will be installed for safety and security purposes. The illumination from these lights will be visible in the immediate vicinity of the substation. In general, the lighting at the substation is expected to be consistent with the lighting at the existing Old Town Substation and the illumination of commercial facilities in the vicinity.

UI will employ additional lighting only for work at night under abnormal or emergency conditions. The lights at the new substation will incorporate UI's standard design for illumination of substation yards (i.e., the use of area lights mounted on equipment support structures, perimeter fence posts, and enclosures).

6. ELECTRIC AND MAGNETIC FIELD CONSIDERATIONS

To assess the electric and magnetic fields (EMF) associated with the Project, UI retained Exponent, a company with specialized expertise in such evaluations. Exponent conducted measurements of EMF levels near the existing Old Town Substation and performed preliminary analysis of the EMF levels expected from the new substation. Their conclusion, as noted below, is that because the configurations of the rebuilt substation and relocated 115-kV transmission line connections will be similar to those at the existing substation, and thus will be a small fraction of those recommended for the general public by international health-based standards.

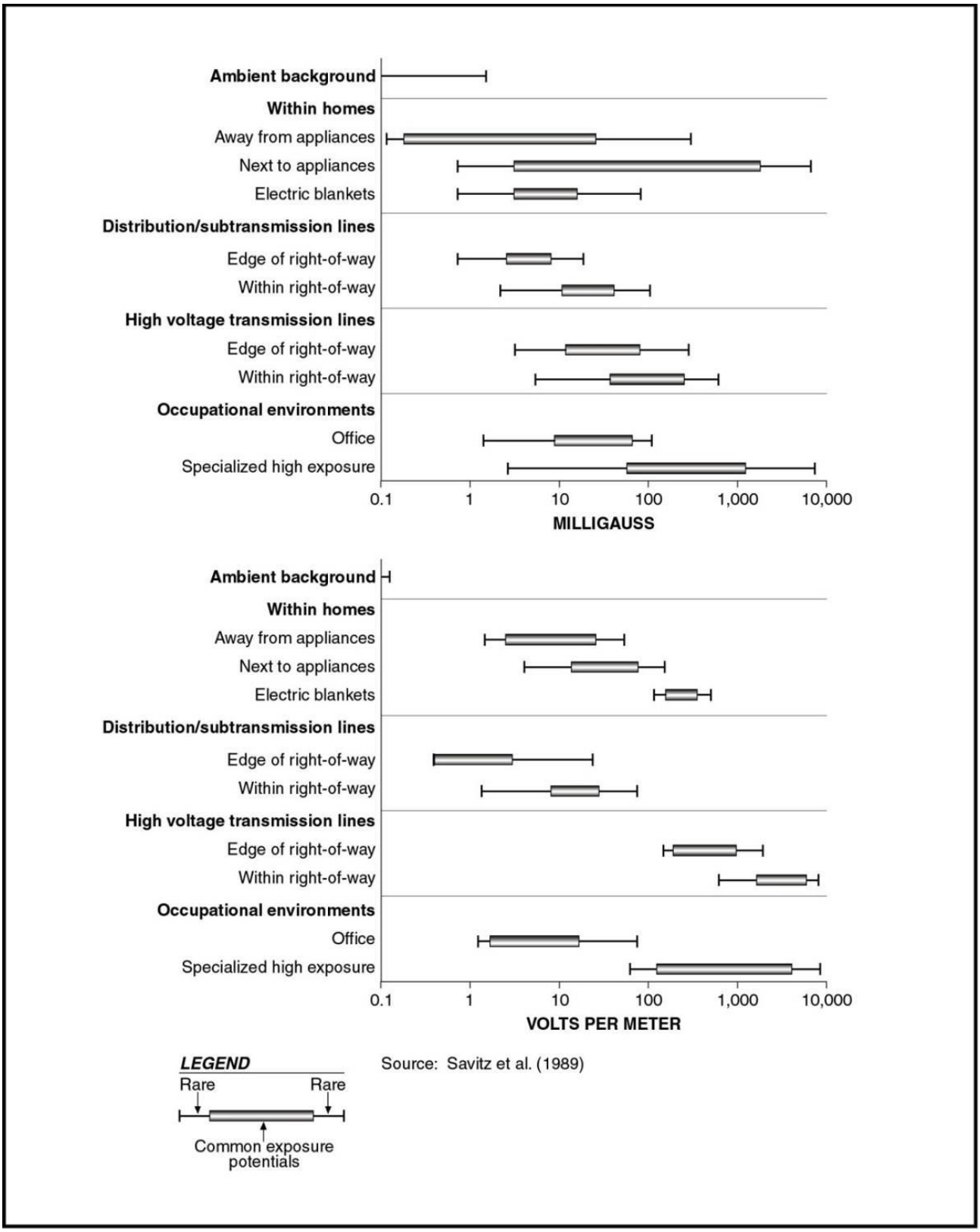
6.1 OVERVIEW

EMF surround anything that generates, transmits, or uses electricity. As a result, people living in modern communities are surrounded by various sources of EMF on a daily basis. Figure 6-1 depicts typical EMF levels in residential and occupational environments, as well as on or at the edges of transmission line ROWs. Magnetic and electric fields are described as follows:

- ***Magnetic Fields:*** The current flowing in the conductors of a substation bus-line or an overhead transmission line generates a magnetic field near the conductor. The strength of Project-related magnetic fields is expressed as magnetic flux density in units of milligauss (mG) where 1 Gauss = 1,000 mG. In the case of alternating current (AC) transmission lines, these currents (and thus magnetic fields) vary in direction and magnitude with a 60-Hertz (Hz) cycle. The level of the magnetic field around conductors varies with the circuit loading. Circuit loadings are expressed in units of amperes (A). Because of variations in circuit loading, measurements or calculations of the magnetic field present a snapshot of the magnetic field at only one moment in time. On a given day, throughout a week, or over the course of months and years, the magnetic field level can change depending upon the patterns of power demand on the bulk transmission system.

- ***Electric Fields:*** The voltage on the conductors of transmission lines generates an electric field in the space between the conductors and the ground. Many objects are conductive, including fences, shrubbery, and buildings, and thus shield electric fields. Electric fields from equipment within the Old Town Substation therefore are not calculated since they are likely to be blocked by the substation fence. In addition, the buried distribution lines will not be a source of 60-Hz electric fields above ground, since electric fields are confined by the cables' conductive sheath as well as blocked by the surrounding soil and duct bank. Electric field levels are expressed in units of kilovolts per meter ("kV/m"); 1 kV/m is equal to 1,000 volts per meter ("V/m").

Figure 6-1: EMF Levels in the Environment



6.2 EMF MEASUREMENTS AND MODELING

To assess EMF from existing sources under pre-Project conditions, Exponent took measurements at locations such as the perimeter of the existing substation site, at locations along the existing and proposed 115-kV line connections, and nearby streets on January 6, 2020. Field levels were measured at a height of 3.28 feet (ft) (1 meter [m]) above ground using instruments meeting IEEE Std.1308-1994[6] for obtaining accurate field measurements at power line frequencies and calibrated by EMDEX, LLC, using methods like those described in IEEE Std. 644-1994 (R2008)[7]. The measurements were taken and reported as the root mean square value of the field in accordance with IEEE Std. C95.3.1-2010[8] and IEEE Std. 644-1994 (R2008).

Measurements indicate that the highest field levels measured around the existing Old Town Substation are due to the overhead transmission lines passing through the substation and existing distribution lines exiting the substation. The main results for magnetic fields are summarized briefly in Table 6-1. The measurements of electric fields were less informative because of interference from the dense foliage surrounding much of the proposed site. The magnetic field levels measured around the substation are generally similar to those measured along Main Street and somewhat higher than those along Sequoia Road, to the north of the substation.

Table 6-1: Measurements of Existing Magnetic Field Levels (mG)

Measurement Path	Min	Mean	Max
Kachele Place (in front of substation)	2.5	8.1	17
Perimeter of existing substation	4.2	7.9	16
Parking lot of adjacent funeral home	0.2	0.5	3.4
Main Street	1.5	6.5	15
Sequoia Road	0.4	1.4	5.6

[6] Institute of Electrical and Electronics Engineers (IEEE). IEEE Recommended Practice for Instrumentation: Specifications for Magnetic Flux Density and Electric Field Strength Meters (IEEE Std. 1308-1994). New York: IEEE, 1994.

[7] Institute of Electrical and Electronics Engineers (IEEE). IEEE Standard Procedures for Measurement of Power Frequency Electric and Magnetic Fields from Alternating Current Power Lines (IEEE Std. 644-1994, Reaffirmed 2008). New York: IEEE, 1994/2008.

[8] Institute of Electrical and Electronics Engineers (IEEE). IEEE Recommended Practice for Measurements and Computations of Electric, Magnetic, and Electromagnetic fields with respect to Human Exposure to Such Fields, 0 Hz to 100 kHz. New York: IEEE. IEEE Std. C95.3.1-2010.

Additional magnetic-field measurements, starting at the substation fence and moving perpendicularly away from the substation to the north, indicate magnetic-field levels (primarily due to the existing transmission lines) fall to less than 2 mG within approximately 60-65 feet of the substation fence. This indicates that the measured magnetic fields at residences along Sequoia Road, more than 400 feet to the north of the perimeter of the existing substation are due to existing local sources (such as underground distribution lines and electrical service for local residents) and not due to the substation. It is expected that this will continue to be the case after expansion of the new substation when the nearest residence north of the substation will be still be more than 200 feet from the proposed substation.

To assess post-Project conditions, Exponent proposes to model the EMF levels from the existing and proposed configurations of the 115-kV lines, assuming peak daily average load conditions at the time of UI's submission of the Application to the CSC (i.e., anticipated first quarter 2020) and projected peak daily average load anticipated within five years after the Project is completed. This approach is consistent with IEEE Std 1127™-2013 that summarizes the engineering experience with EMF from substations as follows:

> In a substation, the strongest fields near the perimeter fence come from the transmission and distribution lines entering and leaving the substation. The strength of fields from equipment inside the fence decreases rapidly with distance, reaching very low levels at relatively short distances beyond substation fences. (p. 26)

The assumptions to be used in the modeling are consistent with CSC guidelines, as summarized in Section 6.4.

6.3 ASSESSMENT CRITERIA

Neither the federal government nor the State of Connecticut has enacted standards for EMF from power lines or other sources at power frequencies; however, the CSC has developed guidelines for siting new transmission lines, as summarized in Section 6.4. Several states have statutes or guidelines that apply to fields produced by new transmission lines, but these guidelines are not health based. For example, New York and Florida have limits on EMF that were designed to limit fields from new transmission lines to levels characteristic of the fields from existing transmission lines.

More relevant EMF assessment criteria include the exposure limits recommended by scientific organizations. These exposure limits are included in guidelines developed to protect health and safety and are based on reviews and evaluations of relevant health research.

The guidelines include exposure limits for the general public recommended by the International Committee on Electromagnetic Safety (ICES) and the International Commission on Non-Ionizing Radiation Protection (ICNIRP) to address health and safety issues.[9] In a June 2007 Factsheet, the World Health Organization recommended that policy makers adopt international exposure limit guidelines, such as those from ICNIRP or ICES (refer to Table 6-2), for occupational and public exposure to EMF.[10]

Table 6-2: ICNIRP and ICES guidelines for EMF exposure at 60-Hz

	Exposure (60 Hz)	
	Electric Field	Magnetic Field
ICNIRP		
Occupational	8.3 kV/m	10 G (10,000 mG)
General Public	4.2 kV/m	2 G (2,000 mG)
ICES		
Occupational	20 kV/m	27.1 G (27,100 mG)
General Public	5 kV/m*	9.040 G (9,040 mG)

*Within power line ROWs, the guideline is 10 kV/m under normal load conditions.

6.4 CONSISTENCY WITH CSC BEST MANAGEMENT PRACTICES

In 2007, the CSC adopted *EMF Best Management Practices for the Construction of Electric Transmission Lines in Connecticut* (EMF BMP) based upon a consensus of health and scientific agencies that the scientific evidence "reflects the lack of credible scientific evidence for a causal relationship between MF [magnetic field] exposure and adverse health effects." (EMF BMP, p. 3). Nevertheless, the CSC concluded that precautionary measures for the siting of new transmission lines in Connecticut are appropriate and should include "the use of effective no-cost and low-cost technologies and management techniques on a project-specific basis to reduce MF [magnetic field] exposure to the public while allowing for the development of efficient and cost-effective electrical transmission projects" (EMF BMP, p. 11).

The CSC's EMF BMP was revised on February 20, 2014; this version of the EMF BMP formed the basis for Exponent's review of the Project's consistency with the CSC guidelines. Although the EMF BMP explicitly applies to transmission lines, not substations, Exponent applied the spirit of these BMPs as

[9] International Committee on Electromagnetic Safety (ICES). IEEE Standard for Safety Levels with Respect to Human Exposure to Electric, Magnetic, and Electromagnetic Fields, 0 Hz to 300 GHz, Standard IEEE C95.1-2019, Oct. 2019; International Commission on Non-ionizing Radiation Protection (ICNIRP). Guidelines for limiting exposure to time-varying electric and magnetic fields (1 Hz to 100 kHz). Health Phys 99: 818-836, 2010.

[10] World Health Organization (WHO). Fact Sheet No. 322: Electromagnetic Fields and Public Health – Exposure to Extremely Low Frequency Fields. Geneva, Switzerland: World Health Organization, 2007.

interpreted for a substation. The Project does not involve the development of new transmission lines, but rather the relocation of existing 115-kV transmission lines. For this reason, the EMF levels from these lines post-Project are expected to be similar to the pre-Project EMF levels.

Exponent considers the Project as consistent with the CSC's EMF BMP for "no cost/low-cost" design because:

- There are no statutory (community) facilities adjacent to the Project.
- The new Old Town Substation will be located adjacent to and will encompass the existing substation property, and the proposed terminations of overhead transmission lines are expected to have essentially no effect on the calculated magnetic field at the closest residences (which are located north of the substation, along Sequoia Road and south of the substation along Kaechele Place).
- The rebuilt substation and reconfiguration of the existing 115-kV transmission lines are sufficient to achieve the standards for adequate, safe, and reliable service without constructing a new substation in a different location and attendant transmission lines, which would be new sources of EMF.

6.5 CONCLUSIONS

The proposed Project is expected to have little effect on EMF levels in the vicinity except for a small shift to the north. Because the configurations of the rebuilt substation and relocated 115-kV transmission line connections will be similar to those at the existing substation, the EMF levels also are expected be similar. Thus, as magnetic fields can vary over the day, month, and season with the demand for electricity, the magnetic field levels reported here serve as provisional estimates of post-Project levels pending calculations of magnetic fields at average and peak loading in the future. Nevertheless, there is little doubt that the calculated magnetic field levels and measured electric levels in the vicinity of the substation will be a small fraction of those recommended for the general public by international health-based standards (i.e., ICES and ICNIRP).

7. PROJECT SCHEDULE

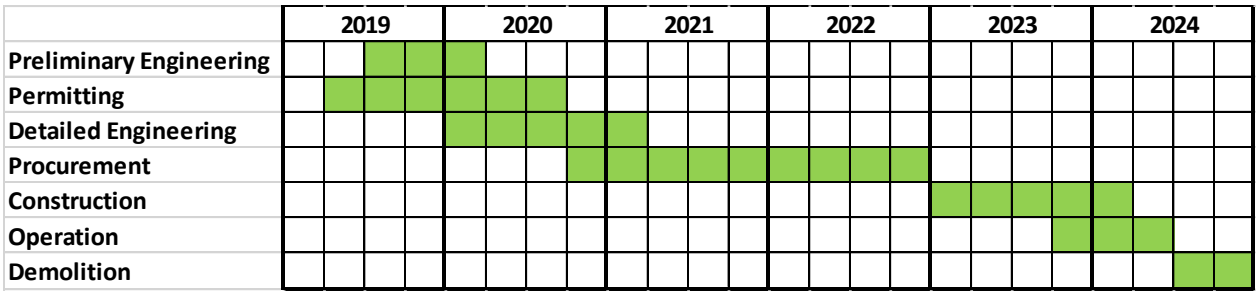
As illustrated in the schedule presented in Figure 7-1, preliminary engineering for the Project was initiated in early 2019. Detailed engineering is expected to commence in 2020.

Figure 7-1 lists the key activities in UI's schedule for developing the Project, including the tasks that led up to the development of this MCF, the planned time line for the submission of the Application to the Council, and the completion of Project engineering, permitting, procurement, and construction.

Based on the current schedule, UI anticipates that the Application will be submitted to the Council in the late March – April 2020. The rebuilt Old Town Substation is expected to be placed into service in 2024.

This proposed schedule could change based on the timing of the receipt of approvals from the Council and other involved regulatory agencies.

Figure 7-1: Project Schedule



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8. PROJECT PERMITS, APPROVALS AND CONSULTATIONS

During the preparation of this MCF, UI consulted with representatives of the City of Bridgeport and the Town of Trumbull, as well as with the CT DEEP, USFWS and SHPO[11]. Appendix B includes correspondence with the regulatory agencies regarding the Project. UI expects to continue to consult with the involved regulatory authorities as the planning for and development of the Project continues. This section identifies the permits and approvals required for the construction and operation of the Project and summarizes the agency and municipal consultations that UI has conducted thus far.

8.1 FEDERAL AND STATE AGENCY APPROVALS REQUIRED AND CONSULTATIONS

In addition to the Application for a *Certificate of Environmental Compatibility and Public Need* from the Council, which UI expects to file in March – April 2020, the Project will require certain approvals from other state regulatory agencies. Table 8-1 summarizes the permits and approvals expected to be required for the Project, along with the status of UI's consultations to date with the involved agencies.

8.2 MUNICIPAL CONSULTATION FILING AND OUTREACH

As part of the Project planning process, UI met with officials from both the City of Bridgeport (August 27, 2019). UI also offered to meet with representatives of the Town of Trumbull but were told by Town representatives that it was unnecessary.

In addition, the Council's MCF process, pursuant to which this document has been prepared, represents a formalized mechanism both for informing the public and elected officials about the proposed Project and for soliciting comments on the Project from local leadership and the interested public. In accordance with C.G.S. § 16-50*l*, applicants intending to apply for a Certificate of Environmental Compatibility and Public Need from the Council must consult with potentially affected municipalities at least 60 days prior to the Application filing date.

[11] As currently planned, the Project is not expected to affect any federal or state inland water resources. As a result, consultation with the USACE, New England District, is not necessary. If, as Project planning proceeds, it is determined that water resources would be affected, UI will consult with and submit appropriate notifications or water resource permit applications to the USACE and CT DEEP.

Table 8-1: Permits and Approvals Expected to be Applicable to the Project

Agency	Potential Permit/Approval Required	Application Submitted or Consultation (Date)	Status
FEDERAL			
USFWS	Request for consultation per Section 7 of the Endangered Species Act (e.g., for potential presence of Northern Long Eared Bat)	Request for threatened/endangered species review - 2019	USFWS response of October 25, 2019 (refer to Appendix B)
STATE			
CONNECTICUT SITING COUNCIL	Municipal Consultation Filing	January 2020	In progress
	Certificate of Environmental Compatibility and Public Need under C.G.S. § 16-50*l*(a)(1)	March – April 2020	Pending
	Development and Management Plan (after issuance of certificate and prior to Council's approval to start construction)	To be determined; depends on timing of CSC approval of Application	Pending
CT DEEP • NDDB	Threatened and endangered species review	Review form submitted October 2019. Project site is not within area of listed habitat per publicly available NDDB mapping.	NDDB response of October 18, 20019 (refer to Appendix B)
• Stormwater	General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities (DEEP-WAPED-GP-015) and SWPCP	Expected to be prepared at generally the same time as the D&M Plan	Pending
CT SHPO	Cultural Resource Consultation under C.G.S. § 16-50*l*(e)	Cultural resources review performed; review form submitted to SHPO in November 2019	Pending SHPO response
MUNICIPAL			
City of Bridgeport	Consultations in conjunction with MCF process	Ongoing	Ongoing
	Coordination with Fire Marshall (Blasting Permit)	If necessary during construction	If necessary
Town of Trumbull	Consultations in conjunction with MCF process	Pending	Pending

The pre-application consultation must include, but not be limited to, good faith efforts to meet with the chief elected official of each potentially affected municipality and to provide technical reports concerning the public need, site selection process and environmental effects of the proposed facilities. Accordingly, this MCF is being provided to the City of Bridgeport, the municipality in which the proposed Project would be located, as well as the Town of Trumbull, the southern boundary of which is less than approximately 0.2 mile north of the Project site.

During the formal 60-day municipal consultation period, UI will offer to meet with the City of Bridgeport mayor and the Town of Trumbull first selectman (or their designated representatives) to review the proposed Project and MCF, as well as to present an overview of the Council's siting process and the methods available for the City to provide input to that process. Comments provided by the City will be reflected in the Application that UI submits to the Council for the Project.

In accordance with the Council's requirements and Connecticut General Statutes § 16-50*l*(e), within 15 days after submitting the Application, UI will supply to the Council all MCF materials provided to the City of Bridgeport and a summary of the consultations with the City, including any comments or recommendations issued by the City.

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9. ALTERNATIVES CONSIDERED

9.1 INTRODUCTION AND SUMMARY

Overview and Conclusions of the Alternatives Evaluation Process

The Project was selected as a result of a process whereby alternatives were identified and assessed. Initially, UI performed a comprehensive evaluation of the asset condition, in relation to existing and future needs, at the existing Old Town Substation. The evaluation found that the equipment at the existing Old Town Substation is more than 50 years old and must be updated to address existing and future demands for providing reliable electricity to the local area. UI determined that the consequences of the "No Action" (i.e., "do nothing") option would pose unacceptable risks to the resiliency of the electric transmission system and the provision of reliable service to customers in the Greater Bridgeport area. Subsequently, UI commissioned a solutions study to assess options for upgrading Old Town Substation.

As part of the solutions study, two alternatives were evaluated:

1. **In-kind Replacement on the Existing Substation Site**. This alternative involves upgrading and replacing the components and equipment at the existing substation within the footprint of the existing 0.9-acre Old Town Substation site. UI found that the small size of the existing substation site poses critical constraints to the required improvements. Moreover, this alternative would expose UI customers to significant reliability risks (given the long equipment outages required to replace and upgrade the substation) and would have construction challenges and safety hazards.

2. **Rebuild Alternative**. This alternative entails developing a new, upgraded 115/13.8-kV substation, either on UI property adjacent to and including the existing Old Town Substation (i.e., the proposed Project) or on a site located elsewhere, near the 115-kV transmission lines to which the substation must connect.

After determining that in-kind replacement is not a feasible alternative (as it would pose constructability challenges and would be less cost-effective than rebuilding a new upgraded substation), UI conducted a review to identify potential locations for the rebuilt substation. This review resulted in the identification of seven potential sites, including the proposed site northeast of Kaechele Place. To facilitate the required connections to Eversource's 115-kV lines, all the alternative sites had to be located adjacent to or near Eversource's transmission line ROW in Bridgeport or Trumbull. UI assessed each of the seven sites, taking into consideration site size, property ownership, proximity to existing transmission lines, distribution line connections required, land use, environmental resources, constructability, and cost. As a result of this review, all the sites but the proposed location were dismissed from consideration due to various overriding

factors (e.g., cost, feasibility of property acquisition, existing land use and environmental constraints, potential for regulatory / siting issues).

After the proposed site was identified as the preferred location to rebuild the substation, UI reviewed different substation configuration options, centering on an AIS design. A GIS substation design, which would be more costly, was not considered as a preferred option for the new substation because the Project site includes enough UI-owned property to accommodate an AIS facility. Typically, a GIS substation is installed in a highly urban environment where there is not enough land to construct an AIS type substation.

In summary, based on the results of the alternatives review process, the proposed Project represents the optimal solution for rebuilding the Old Town Substation, thereby enhancing the reliability of the electric system to the benefit of Connecticut and New England consumers. The location of the new Old Town Substation on the proposed site, which is adjacent to the existing substation, will facilitate interconnections to the existing transmission network and to UI's distribution system.

The following sections provide additional information regarding the alternatives process that led to the selection of the proposed Project.

9.2 NO ACTION ALTERNATIVE

Under the No Action Alternative, the existing Old Town Substation would continue in-service at the present site, with no improvements made to mitigate reliability risks by upgrading the substation's existing transmission and distribution system infrastructure. Consequently, no action would be taken to resolve the substation's current infrastructure issues (e.g., reliability and operational issues with respect to the substation's transmission and distribution infrastructure, obsolete 115-kV OCB and associated disconnect switches, inadequate control enclosure, insufficient access/clearance for emergency 115/13.8-kV mobile transformers, inadequate lightning protection).

The No Action Alternative was rejected because it would not resolve the asset condition issues at Old Town Substation, and thus would not improve the reliability of the electric system. As a result, the substation would remain outdated and at risk for equipment failures that would lead to extended duration outages affecting customers and the bulk power system.

9.3 SUBSTATION SITE ALTERNATIVES

The existing Old Town Substation, which is located on a 0.9-acre site, has undergone modifications since it was placed into service in the mid-1960s, and now is fully built out, with no room for expansion. Studies commissioned by UI (i.e., the *Old Town Substation Needs Assessment, March 2014*) confirmed that the substation has significant asset condition deficiencies that require upgrades or replacement. To rectify these deficiencies, UI investigated the two primary alternatives, as discussed in the following subsections:

- In-kind modifications and upgrades to the existing Old Town Substation on the existing site, as well as on a portion of UI-owned property abutting and to the north of the existing site.
- Full rebuild of the substation, either on geographically distinct sites or on the undeveloped UI-owned property (i.e., at 330 and 312 Kaechele Place) located to the north and east of the existing substation site.

9.3.1 In-Kind Modifications/Upgrades at Existing Old Town Substation Site

The in-kind replacement option would require upgrading the existing substation facilities to address all the identified needs, including the replacement of transformers to conform to UI's current standard for substation distribution power transformer sizing, the provision of access for a mobile substation transformer, adding a new pre-fabricated control enclosure, etc. The in-kind upgrades would be concentrated on the existing 0.9-acre substation site. In total, the in-kind substation replacement is estimated to cost approximately $47 million.

UI determined that the in-kind replacement option poses various constraints and construction challenges. For example, to perform the in-kind replacement, the existing substation equipment would have to be taken out of service for an extensive length of time and construction activities would have to be closely coordinated with available outage periods. Further, a mobile substation would be required at the site to accommodate equipment outages while still maintaining reliable service to UI customers; the use of the mobile substation at Old Town Substation would make it unavailable for other uses and would further increase the complexity of the substation construction. In addition, there would be an increased safety risk during construction because the substation upgrades would have to be performed in proximity to energized equipment. Finally, the in-kind replacement option does not include any provisions for the expansion of the substation to serve the future needs of customers in the region or for the replacement of equipment that may become obsolete in the near future (the equipment to be replaced would focus only on the items specifically identified in the March 2014 *Needs Assessment*).

9.3.2 Full Substation Rebuild

9.3.2.1 Alternative Site Selection Process

After determining that Old Town Substation's asset condition issues could not feasibly be addressed by in-kind replacement on the existing site, UI conducted a review to identify and assess potential sites for rebuilding Old Town Substation. This study was based on UI's general site selection guidelines and specific selection criteria, as summarized below.

General Site Selection Guidelines

To identify potentially feasible alternative sites for rebuilding the existing Old Town Substation, UI used an iterative process whereby potential properties were first identified and screened in accordance with the Company's standard objectives for substation siting, which are to:

- Minimize the need to acquire residences and viable commercial/industrial uses to accommodate substation development.
- Maintain consistency/compatibility with existing land uses and land use plans to the extent possible.
- Minimize adverse effects on sensitive environmental resources and the social environment.
- Maintain public health and safety.
- Demonstrate cost-effectiveness, while adhering to good engineering and sound environmental planning practices.
- Present the public with a clear and well documented methodology for the identification of the proposed and alternative sites.

Site Selection Criteria Specific to the Substation Rebuild

In addition to the criteria described above, key considerations in the identification of potential sites for rebuilding and upgrading Old Town Substation were:

- Distance to the existing Old Town Substation and the Eversource 115-kV transmission lines that must connect to the substation.
- Availability of property (e.g., sites that are UI-owned, vacant/undeveloped, for sale, or would not require the removal or relocation of existing commercial or residential uses).
- Site size (a minimum of about 2.75 acres, including undeveloped buffer areas and setbacks, is needed for a 115/13.8-kV AIS facility of the type required for the new substation).

- Site topography and subsurface conditions.

- Environmental and land use characteristics, including present and past property uses; presence of jurisdictional water resources, cultural resources, or threatened or endangered species; need for environmental remediation, etc.

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- Substation constructability.

- Availability of property (e.g., via fee ownership or easement) for transmission and distribution line connections to the substation and the lengths of the new transmission and distribution line segments required to connect the new substation to the transmission network and UI's distribution system in the Greater Bridgeport area.

- Accessibility.

- Permitability (the anticipated ability to obtain all required regulatory approvals for construction at the site).

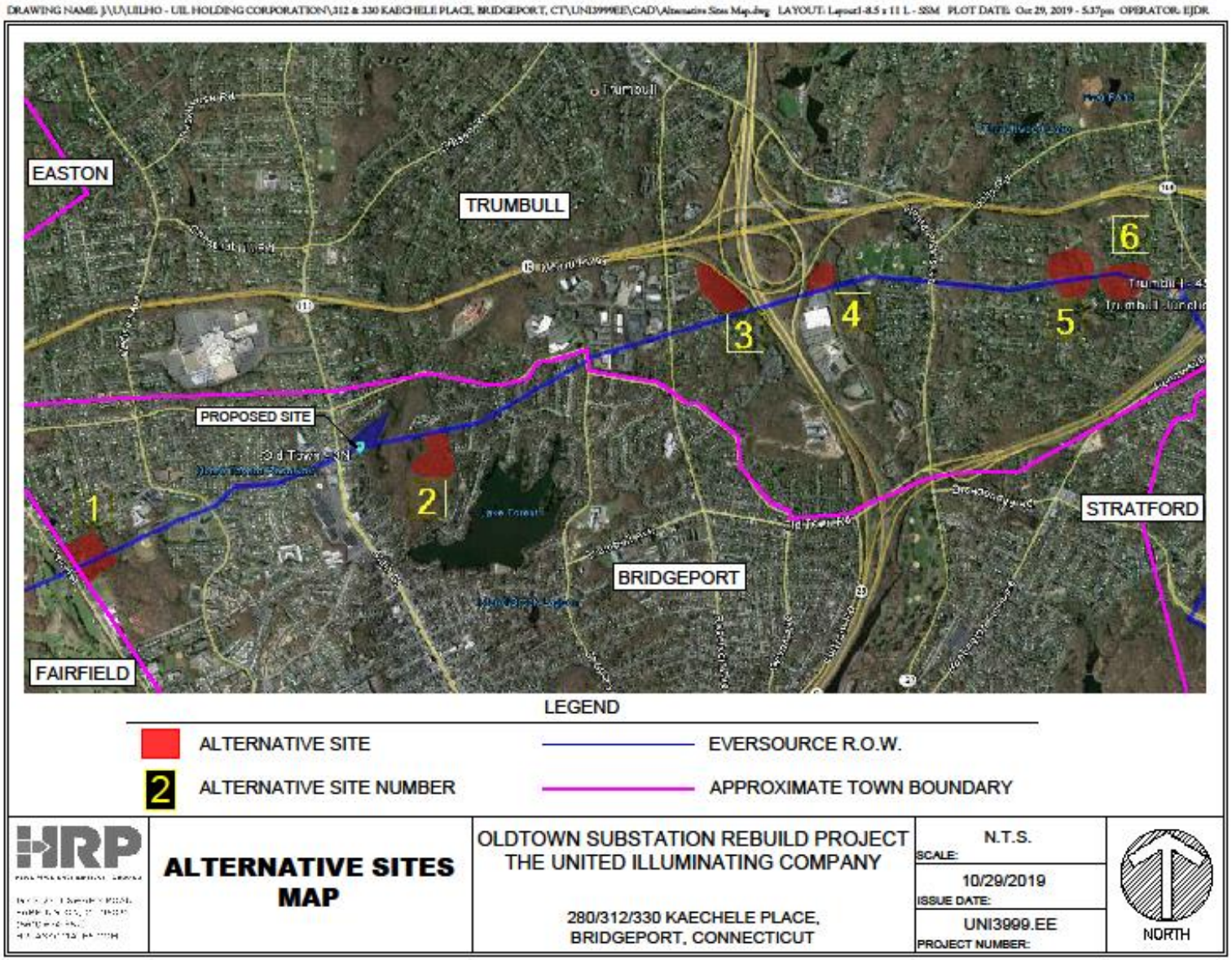
- Cost.

9.3.2.2 Results of the Site Screening Process

Because of the suburban/urban development in the general vicinity of the existing Old Town Substation and the need for any new substation to connect to the transmission network that presently links the existing substation, UI's study focused on potential alternative sites located along Eversource's 115-kV transmission line ROW. This ROW presently traverses through Old Town Substation and includes three 115-kV lines, two of which connect to the existing Old Town Substation.

As Figure 9-1 illustrates, seven potential alternative sites for the new Old Town Substation, including the proposed site, were identified. All the alternative sites are situated adjacent to or near the Eversource 115-kV transmission line ROW in Bridgeport or Trumbull and consist of privately or publicly owned properties that are presently undeveloped or include vacant areas that potentially could accommodate the substation. Further, due to the need to efficiently and cost-effectively connect the new substation to the transmission grid and to distribution lines in the territory presently served by the existing Old Town Substation, all the alternative sites are within several miles of the existing substation.

Figure 9-1: Alternative Substation Site Locations



UI evaluated each of the sites based on the site selection general guidelines and site-specific criteria. Table 9-1 summarizes information about each alternative site (e.g., address, existing land use) and the results of UI's evaluations of the suitability of each alternative site for the new Old Town Substation.

As Table 9-1 indicates, UI determined that only the proposed Project site represents a viable, cost-effective alternative for the new Old Town Substation. Specifically, none of the other sites are presently owned by UI or dedicated to utility use. As a result, property acquisition would pose challenges and would increase costs. Several of the sites have land use constraints (e.g., presence of wetlands, recreational uses), while others would require costly distribution system connections. Because none of the alternative sites are in the immediate vicinity of the existing Old Town Substation, no efficiencies would be realized by minimizing new transmission and distribution line connections. As a result, all six of the alternative sites were eliminated from consideration in favor of the proposed Project site adjacent to Kaechele Place.

9.3.2.3 Justification for the Selection of the Preferred Site

The Project represents the least-cost option for rebuilding Old Town Substation. In addition to cost, UI selected its property at 280, 312, and 330 Kaechele Place as the preferred location for the new substation due primarily to the following factors:

- **Availability of Property**. UI owns the property on which the new Old Town Substation would be rebuilt.

- **Direct Proximity to Existing Old Town Substation and Transmission/Distribution Connections**. The use of the UI-owned property at 330 and 312 Kaechele Place will allow the rebuild of the Old Town Substation, incorporating the existing 0.9-acre site into the new substation's footprint and minimizing the modifications to transmission and distribution lines needed to interconnect with the new facility.

- **Land Use Consistency**. The new substation will be located adjacent to and will encompass the existing Old Town Substation, which has been devoted to utility use for more than 50 years. Although the development of the new substation will require the conversion of currently undeveloped forest to utility purposes, UI will maintain a forested buffer, to the extent practical, between the fenced substation and lands to the north and east.

- **Avoidance / Minimization of Environmental Impacts**. The new substation will be developed on an upland site and will not result in significant impacts to environmental resources.

Table 9-1: Summary of Alternative Sites Identified for the New Old Town Substation

Site Name / Number (refer to Figure 9-1) / Municipality	Existing Land Use	Ownership	Siting Considerations / Constraints
Bridgeport			
4750 Park Avenue (1)	Veterans Memorial Park, north of Discovery Museum. Site consists of woodlands and recreational areas and is immediately east of Fairchild Wheeler Golf Course	Public	Would require acquisition of municipal recreational property and conversion to utility use. Access to the substation from Park Avenue would have to be developed. Residential areas are located to the north and east.
561 Frenchtown Road (2)	Elton Rodgers Woodland Park, wooded	Public	Undeveloped woodland recreational area would have to be converted to utility use. Parcel also contains wetlands, which could be affected by substation development, as well as rock outcrops and steep topography, which would add to constructability issues. Nearby land uses are residential.
280, 312, 330 Kaechele Place **(Proposed Site)**	Existing Old Town Substation / undeveloped wood and shrub land	Private (UI)	Property is presently owned by UI; the existing Old Town Substation has occupied a portion of the site for over 50 years. Transmission and distribution line connections require minimal modification to link to the rebuilt substation.
Trumbull			
2300 Reservoir Avenue (3)	Former Henderson Hardware, currently being cleared of vegetation.	Private (Sacred Heart University)	After initial alternatives analysis, site was acquired by Sacred Heart University and is no longer available for other development.
Quarry Road (4)	Commercial (movie theater) and various office uses; site is at end of cul-de-sac, near walking/hiking trails and Unity Park	Private	Property is east of State Route 25 and south of the Merritt Parkway interchange, leaving limited land for substation development. Also, extensive additional costs would be required as the alternative site is distant from the existing Old Town Substation. The available acreage is limited and may not accommodate the required new substation build out.
Rocky Ridge Drive/Quail Trail (5)	Woodland, surrounded by single-family residential neighborhoods, wetlands and stream on property	Public	Property is east of State Route 25, near State Route 8, and is distant from the existing Old Town Substation. Access to property is only via residential streets. Extensive additional costs would be required for distribution connections.
Huntington Turnpike (6)	Woodland, with single-family residential neighborhood to the north and residential areas along Huntington Turnpike	Public	Adjacent to and with same feasibility issues as Site 5, above.

9.4 SUBSTATION DESIGN AND TRANSMISSION LINE CONFIGURATION OPTIONS

Substation Design Alternative

The objective of the Project is to replace the existing AIS Old Town Substation with a similar but upgraded AIS facility. A GIS configuration was not considered for the Project because the existing UI property at the proposed Project site is more than adequate to accommodate an AIS design. Further, a GIS configuration, which would occupy a smaller footprint and is typically implemented in densely developed urban environments where land is limited, would cost more than the proposed AIS design.

Transmission Line Configurations

The relocation of 115-kV line connections from the existing Old Town Substation to the new substation was a consideration in the overall Project planning. UI's proposed alignments for the transmission line reconnections were selected to minimize the length of each line. As a result, the transmission line structure replacements and removals, as proposed, represent the most efficient and cost-effective configurations for realigning the 115-kV lines into the new substation.

The line connections to the new substation will require the acquisition of an easement on approximately 0.15-acre of City of Bridgeport property in Elton Rodgers Woodland Park. The area is directly adjacent to the southeast corner of UI's property, where the overhead transmission lines would extend northwest from Eversource's ROW, crossing over municipal land before entering UI's property into the new substation. Beneath and adjacent to the transmission lines in this location, vegetation clearing will be required to provide appropriate clearances between the overhead 115-kV lines and adjacent vegetation.

Instead of extending the 115-kV transmission lines overhead into the substation, UI considered the alternative use of an underground 115-kV cable configuration. Under this alternative, a short segment of underground transmission line would extend from a transition structure located on the Eversource ROW into the rebuilt substation, where the line would transition back to an overhead configuration. The underground line segment would consist of cross-linked polyethylene (XLPE) cable, contained within a concrete-encased duct bank (consisting of several PVC conduits).

The typical costs for constructing and underground 115-kV transmission system are five to 10 times greater than those for installing an equivalent length of overhead 115-kV transmission. Further, because of the more complicated engineering design and construction, along with the geometry of the land for a hybrid underground/overhead configuration connection to the rebuilt substation, UI prefers the overhead line alignment, as proposed.

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10. ACRONYMS AND GLOSSARY OF TERMS

Acronym	Description
115-kV:	115-kilovolts or 115,000 volts
AC:	Alternating current
ACSR:	Aluminum conductors with steel reinforcement, a common type of overhead conductor
ACSS:	Aluminum Conductor with Steel Support, a common type of overhead conductor
AIS:	Air-insulated substation
Ampere:	(Amp): A unit measure for the flow (current) of electricity. A typical home service capability (i.e., size) is 100 amps; 200 amps is required for homes with electric heat
ANSI:	American National Standards Institute
APE:	Area of Potential Effect (for cultural resources)
Application:	Application to the Connecticut Siting Council for a Certificate of Environmental Compatibility and Public Need
BMP:	Best Management Practices
Cable:	A fully insulated conductor usually installed underground but, in some circumstances, installed overhead.
CCVT:	Capacitor coupled voltage transformer
Certificate:	Certificate of Environmental Compatibility and Public Need (from the Connecticut Siting Council)
C.G.S.:	Connecticut General Statutes
Circuit:	A system of conductors (three conductors or three bundles of conductors) through which an electrical current is intended to flow, and which may be supported above ground by transmission structures or placed underground
Circuit Breaker:	A switch that automatically disconnects power to the circuit in the event of a fault condition. Located in substations. Performs the same function as a circuit breaker in a home
Conductor:	A metallic wire, busbar, rod, tube or cable that serves as a path for electric current flow
Conduit:	Pipes, usually PVC plastic, typically encased in concrete, for housing underground power cables
CONVEX:	Connecticut Valley Electric Exchange
Council (or CSC):	Connecticut Siting Council
CT:	Current transformer
CT DEEP:	Connecticut Department of Energy and Environmental Protection
CT DOT:	Connecticut Department of Transportation
D&M Plan:	Development and Management Plan (required by the Connecticut Siting Council)
dBA:	Decibel, on the A-weighted scale
Distribution:	The facilities that transport electrical energy from the transmission system to the customer

Acronym	Description
Disconnect Switch:	Equipment installed to isolate circuit breakers, transmission lines or other equipment for maintenance or sectionalizing purposes
Duct:	Pipe or tubular runway for underground power cables (see also Conduit)
Duct Bank:	A group of ducts or conduit installed underground and usually encased in concrete
EF, Electric Field:	Invisible lines of force produced by voltage applied to conductors and equipment. The electric field is expressed in measurement units of volts per meter (V/m) or kilovolts per meter (kV/m); 1-kV/m is equal to 1,000 V/m
Electric Transmission:	The facilities (69-kV and higher) that transport electrical energy from generating plants to distribution substations
EMF:	Electric and magnetic field
EMF BMP Document:	Electric and Magnetic Fields Best Management Practices for the Construction of Electric Transmission Lines in Connecticut prescribed by the Connecticut Siting Council
Eversource:	The Connecticut Light & Power Company dba Eversource Energy
FEMA:	Federal Emergency Management Agency
FIRM:	Flood Insurance Rate Map
G:	Gauss; 1G = 1,000 mG (milliGauss); a unit of measure for magnetic field
GIS:	Gas Insulated Substation
Ground Wire:	Cable/wire used to connect wires and metallic structure parts to the earth. Sometimes used to describe the overhead lightning shield wire.
Hz:	Hertz, a measure of alternating current frequency; one cycle/second.
ICES:	International Committee on Electromagnetic Safety, a committee of the Institute of Electrical and Electronics Engineers
ICNIRP:	International Council on Non-Ionizing Radiation Protection, a specially chartered independent scientific organization
IEC:	International Electro-technical Commission
IEEE:	Institute of Electrical and Electronics Engineers
kcmil:	1,000 circular mils, approximately 0.0008 sq. in
kV:	Kilovolt, Equals 1,000 volts
kV/m:	Electric field unit of measurement (kilovolts/meter)
LiDAR:	Light detection and ranging (remote sensing technology)
Line:	A series of overhead transmission structures that support one or more circuits; or in the case of underground construction, a duct bank housing one or more cable circuits
MCF:	Municipal Consultation Filing, part of the Connecticut Siting Council application process
MF, Magnetic Field:	Invisible lines of force produced by the flow of electric currents; however, unlike electric fields, most materials do not readily block magnetic fields. The level of a magnetic field is commonly expressed as magnetic flux density in units called gauss (G), or in milliGauss (mG), where 1 G = 1,000 mG.
mG:	milliGauss (see Magnetic Field)
MVA:	Megavolt ampere
MVAR:	Meagavolt ampere reactive

Acronym	Description
NAAQS:	National Ambient Air Quality Standards
NAVD88:	North American Vertical Datum 1988
NDDB:	Connecticut Natural Diversity Data Base (CT DEEP)
NERC:	North American Electric Reliability Council, Inc. (initially, the National Electric Reliability Council)
NESC:	National Electrical Safety Code
NFPA:	National Fire Protection Association
NPCC:	Northeast Power Coordinating Council
NRCS:	Natural Resources Conservation Service (United States Department of Agriculture)
NRHP:	National Register of Historic Places
OCB:	Oil circuit breaker
OPGW:	Optical groundwire (a shield wire containing optical glass fibers for communication purposes)
Phases:	Transmission (and some distribution) AC circuits are comprised of three phases that have a voltage differential between them.
Project:	Old Town Substation Rebuild Project
PSI:	Pounds per square inch
PVC:	Polyvinyl chloride (material used in making conduits for XLPE-insulated cable and other purposes)
RCSA:	Regulations of Connecticut State Agencies
ROW:	Right-of-way
SCADA:	Supervisory Control and Data Acquisition
SHPO:	State Historic Preservation Office
SPCC:	Spill Prevention and Countermeasures Plan
S/S (Substation):	A fenced-in yard containing switches, transformers, line-terminal structures, and other equipment enclosures and structures. Adjustments of voltage, monitoring of circuits and other service functions take place in this installation.
Steel Monopole Structure:	Transmission structure consisting of a single tubular steel column with horizontal arms to support insulators and conductors.
SWPCP:	Stormwater Pollution Control Plan - A sediment and erosion control plan that also describes all the construction site operator's activities to prevent stormwater contamination, control sedimentation and erosion, and comply with the requirements of the federal Clean Water Act.
Terminal Point:	The substation or switching station at which a transmission circuit terminates.
Terminal Structure:	Structure typically within a substation that ends a section of transmission line.
Transformer:	A device used to transform voltage levels to facilitate the efficient transfer of power from the generating plant to the customer. A step-up transformer increases the voltage while a step-down transformer decreases it.
Transmission Line:	Any line operating at 69,000 or more volts.
UI:	The United Illuminating Company

Acronym	Description
USACE:	United States Army Corps of Engineers
USGS:	United States Geological Survey (U.S. Department of the Interior)
V/m:	Volts per meter
Voltage:	A measure of the push or force that transmits energy.
WHO:	World Health Organization
XLPE:	Cross-linked polyethylene
XS:	Cross-section (drawing)

APPENDICES

Appendix A: Maps and Drawings

Appendix B: Agency Correspondence

- B.1: State Historic Preservation Officer (SHPO)
  - B.1.1: SHPO Project Review Form
  - B.1.2: SHPO Concurrence Letter (pending)
- B.2: Connecticut Department of Energy and Environmental Protection Natural Diversity Database (NDDB)
  - B.2.1: NDDB Request Form
  - B.2.2: NDDB Determination Letter
- B.3: U.S. Fish and Wildlife Service (USFWS) Consultation

Appendix C: Ecological Assessment Report

Appendix D: Preliminary Visual Assessment and Photo-Simulations

Appendix E: Cultural Resources Report

Appendix F: Environmental Noise Assessment