STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

The United Illuminating Company Application for a Certificate of Environmental Compatibility and Public Need for the Construction, Maintenance, and Operation of a Proposed 115/13.8 Kilovolt Substation Located at 14 Old Stratford Road, Shelton, Connecticut.	))))))	Docket 433 February 19, 2013

Proposed Findings of Fact

Introduction

1. The United Illuminating Company (UI or the Company), in accordance with provisions of Connecticut General Statutes Sections 16-50g et seq., and Section 16-50j-1 et seq. of the Regulations of Connecticut State Agencies (RCSA), applied to the Connecticut Siting Council (the Council) on October 3, 2012 for the construction, operation, and maintenance of a new substation to be located on approximately two acres of UI's six-acre property located at 14 Old Stratford Road, Shelton, Connecticut (the Shelton Substation or the Project). (UI 1, pp. 1-2).

2. The purpose of the proposed facility is to provide increased distribution system capacity to ensure and improve electric system reliability in response to increasing load growth in the City of Shelton and surrounding communities. (UI 1, p. 1).

3. The party in this proceeding is UI. The Connecticut Light and Power Company (CL&P) is the intervenor. (1/17/2013 3:00 p.m. Hearing Transcript [Tr. 1], p.4).

4. Pursuant to General Statutes § 16-50m, the Council, after giving due notice thereof, held a public hearing on January 17, 2013, beginning at 3:00 p.m. and continued at 7:00 p.m. The hearing was noticed for the Shelton City Hall, the Auditorium, 54 Hill Street, Shelton. (Tr. 1, p. 3; 1/17/2013 7:00 p.m. Hearing Transcript [Tr. 2], p. 3).

5. The Council and its staff made an inspection of the proposed substation site on January 17, 2013 beginning at 2:00 p.m. (Council's Hearing Notice dated December 14, 2012; Tr. 1, p. 12).

6. Pursuant to CGS § 16-50*l*(b), public notice of the application was published in *The Connecticut Post* on September 21 and September 23, 2012. (UI 1, p. 7).

7. Pursuant to CGS § 16-50*l*(b), notice of the application was provided to all abutting property owners by certified mail. (UI 5; UI 1, pp. 8-10).

8. UI erected a sign, measuring four feet by six feet, on its property on Old Stratford Road, which provided a brief description of the docket and notice of the Council's January 17, 2013 hearing. The sign also indicated that a copy of the application and additional information is available on the Council's website or by calling the Council. The sign on Old Stratford Road was installed on January 2, 2013. (UI 6).

9. Pursuant to CGS § 16-50*l*(b), UI provided notice to all federal, state and local officials and agencies listed therein. (UI 1, p. 3).

State Agency Comment

10. Pursuant to CGS § 16-50j(h), on December 14, 2012, the Council solicited comments from Connecticut state agencies that received the application: Department of Energy and Environmental Protection (DEEP), Department of Public Health (DPH), Council on Environmental Quality (CEQ), Public Utility Regulatory Authority (PURA), Office of Policy and Management (OPM), Department of Economic and Community Development (DECD), Department of Agriculture and the Department of Transportation (DOT). (Council Memorandum dated December 14, 2012).

11. The Council received responses from the DOT's Bureau of Engineering and Construction on January 7, 2013. (DOT Comments dated January 7, 2013. Record). DOT indicated that the only DOT permit the facility would require is a Highway Encroachment Permit. Since the Project may result in a curb cut, paving, tree/brush cutting, and underground utility work on State Route 714 (Bridgeport Avenue), and drainage discharge within the state right-of-way, the permit must be obtained prior to commencement of work within the right-of-way. (DOT Comments dated January 7, 2013. Record).

State Historic Preservation Office and Tribal Nation Comments

12. In December 2011 UI solicited input from the Connecticut State Historic Preservation Office (SHPO) regarding the potential effect of the substation on cultural resources. In correspondence dated June 28, 2012, the SHPO confirmed that the development of the substation would have no adverse effect on cultural resources. (UI 1, pp. 41, 52; Appendix B).

13. In September, 2012, UI solicited the Mashantucket Pequot Tribal Nation and the Mohegan Tribe to submit written comments regarding the proposed facility. The respective Tribal Historic Preservation Officers indicated that they anticipated no adverse effects on any Native American religious or cultural resources as a result of the Project. (UI 1, p. 41; Appendix B, email letter from Mashantucket Pequot Tribal Nation dated September 12, 2012; UI 3; UI 7, p. 9).

Municipal Consultation

14. UI met with Shelton officials and residents prior to the start of the municipal consultation process, including a December 2011 meeting attended by representatives from Shelton's Planning and Zoning Commission and Inland Wetlands Commission. (UI 2, Public Outreach Log; UI 1, Table XI-2).

15. On July 2, 2012, UI submitted the Municipal Consultation Filing to Shelton Mayor Lauretti, pursuant to CGS § 16-50*l*(e). On the same day, UI submitted the Municipal Consultation Filing to Stratford Mayor Harkins. (UI 2, Attachments A1 and A2).

16. On October 3, 2012, UI provided a copy of the Application to the following municipal agencies: Shelton Conservation Commission & Trails, Shelton Planning and Zoning Commission, Shelton Inland Wetlands & Watercourses Commission, Stratford Planning and Zoning Commission, Stratford Zoning Commission, Stratford Planning Commission, Stratford Inland Wetlands & Watercourse Commission, and Stratford Conservation Department. (UI 1, at 3).

17. A representative of the Shelton Mayor made a limited appearance statement into the record at the January 17, 2013 hearing expressing support for the Project. (Tr 1. pp. 6-7).

Need

18. The Shelton Substation is needed to serve the increased demand for electricity that is expected to occur over the next ten years in the Greater Shelton Area (Shelton, Trumbull, Ansonia, Derby and portions of Stratford and Orange) and to eliminate a voltage collapse risk and possible rolling blackouts during contingency conditions at Indian Well Substation. (UI 1, p. 11).

19. The Greater Shelton Area is served by four substations (Trap Falls, Indian Well, Ansonia, and Trumbull), which transform (step down) the electric power carried by regional 115-kV transmission lines to appropriate levels for distribution to residential, commercial, and industrial consumers. These four substations principally serve Shelton, Ansonia, Derby, and Trumbull. (UI 1, p. 11)

20. Studies by UI indicate that there will be a capacity need in the Greater Shelton Area by the 2015 summer peak. The Greater Shelton Area is projected to experience a combined load growth of nearly 37 MVA over the next 10 years. Thirteen (13) MVA will be from specific new loads and 24 MVA from the total ambient load growth of all four substations in the area. (UI 1, p. 13).

21. UI expects to use all available capacity of the four existing substations and to transfer distribution load between these substations to the extent possible. In an effort to address an imminent capacity need at Indian Well Substation, UI has implemented various permanent and temporary distribution load transfer projects. However, by 2015, these load transfer solutions will be exhausted and Indian Well Substation cannot be relieved any further. (UI 1, pp. 13-15).

22. UI considered ten alternatives to address the load growth and distribution capacity need in the Greater Shelton Area. The alternatives were evaluated based on economics and system performance (capacity, availability, and reliability), as well as engineering considerations. Based on the evaluation, the alternatives, with one exception, do not address the load growth to allow the substations in the Greater Shelton Area to remain below their firm ratings and/or they present a reliability risk to the system. The one alternative that does address the capacity problem in the area and is therefore a viable solution is a new 115/13.8-kV two transformer substation in the Greater Shelton Area, preferably along the Route 8 corridor. (UI 1, Appendix G, p. 17).

Site Alternatives

23. After identifying a need for a new substation in the Greater Shelton Area, UI performed analyses to identify and evaluate alternative sites for the substation and, from among these alternatives, to select a preferred location for the new substation. (UI 1, pp. 63-64; Appendix H, Site Selection Study).

24. UI identified 36 potential sites for initial consideration for development of the new substation. Ultimately, the Company determined there were three sites that appeared feasible. (UI 1, pp. 66-67).

25. In its site evaluations, UI used the following criteria to judge a particular location's viability: transmission and distribution considerations; construction and access considerations; permitting and environmental considerations; and real estate considerations. (UI 1, pp. 66-67).

26. The three sites evaluated were: Derby Junction; Trap Falls Substation; and 14 Old Stratford Road. (UI 1, p. 67).

27. Derby Junction is located at the north end of Constitution Boulevard North, at the intersection of CL&P's 115-kV overhead Stevenson–Devon transmission lines and UI's 115-kV Derby Junction–Indian Well–Ansonia overhead transmission lines. While its location offers transmission benefits, UI deemed the site ultimately unsuitable for the Project, due to environmental, real estate and financial considerations. It is presently characterized by old field vegetation, bordered by forest lands and wetlands. Zoned R-1, Derby Junction lies within an area identified as conserved open space and is within 0.2 miles of Shelton High School. Thus, developing a substation in this location does not support the City's land use plans. Furthermore, developing a substation on this property would require construction of costly distribution infrastructure, as it is not proximate to the load centers in the southern portion of the City. (UI 1, pp. 68-69).

28. The Trap Falls Substation site lies in the southern portion of Shelton near the Town of Stratford boundary, and is immediately adjacent to UI's existing Trap Falls Substation at 102 Armstrong Road. It would offer a number of positive features, including its proximity to load centers, UI's current ownership of the property, adjacency to the existing Trap Falls Substation, location next to the Devon-Derby transmission lines, and availability of land. However, as with Derby

Junction, it presents too many challenges to remain a viable option. Due to the size of the existing Trap Falls Substation, the presence of the nearby CL&P 115-kV transmission line corridor, and steep topography of the property, the new facilities would have to be built on a 2.5-acre area of land relatively close to nearby residences. UI would need to construct a new ductline and splicing chamber system along Armstrong Road towards Old Stratford Road, which would be costly since it would require relocation of a water main as well as the existing ductline. Moreover, due to the existing underground facilities within Armstrong Road, an additional third ductline could not be accommodated within the road for future expansion of a three-transformer substation. Instead, interconnection to the existing distribution network with a third ductline would necessitate underground easements from private property owners, and associated construction activities would prove disruptive to these residential areas. (UI 1, pp. 69-71).

29. UI determined that the proposed site at 14 Old Stratford Road is the most ideal option for the new substation. First, it serves as the most cost-effective location. UI already owns the property. It is close to the load growth pockets in the southern portion of the City which mitigates costs of distribution infrastructure, and the site presents no congestion issues with respect to underground distribution. Its location directly along CL&P's existing 115-kV transmission ROW offers an obvious advantage, as does its isolated surroundings. Construction and operation of a substation at this site should thus result in little inconvenience or disruption to Shelton residents. Finally, the site is a former industrial property that is presently vacant and therefore underutilized. The Lord Corporation (Lord), the former industrial owner of the property, has remediated the site pursuant to a consent order agreement with DEEP. Lord continues to remediate groundwater contamination on the eastern end of the property and maintains groundwater injection wells on the eastern portion of the property for this purpose. Development of this property for a substation would effectively re-adapt this brownfield site for productive use and therefore enhance its property value. (UI 1, pp. 71-72; UI 7, pp.6-7; Tr. 1, pp. 38-42, 45).

Description of Proposed Project

30. The Shelton Substation is proposed for location on a two-acre portion of a six-acre parcel of UI property at 14 Old Stratford Road. The six-acre UI property is bounded to the east by State Route 8, to the south by Old Stratford Road, to the west by Pootatuck Place, and to the north by the Far Mill River. A CL&P easement, occupied by 115-kV overhead transmission lines, extends across the western portion of the property. The two-acre substation site is located on the western portion of the UI property, east of and adjacent to the CL&P 115-kV transmission line corridor. (UI 1, p. 18; UI 7, Attachment A).

31. UI will construct the substation within portions of the 100- and 500-year floodplain of the Far Mill River as designated by the Federal Emergency Management Agency (FEMA). The Project will not be located within the FEMA-designated floodway of the river. (UI 7, pp. 2-3, Attachment A).

32. The proposed substation facilities will include: (i) a 115-kV circuit breaker; (ii) six 115-kV disconnect switches; (iii) two 50 MVA power transformers to step down the voltage from 115-kV to 13.8-kV; (iv) a position to accommodate a temporary, mobile transformer for emergency conditions; (v) two metal switchgear enclosures, each approximately 44 feet long, 14.5 feet wide, and 14 feet high, which will be installed to provide for the switching equipment, relaying and control equipment; and (vi) a metal control enclosure (building for equipment protection), approximately 66 feet long by 28 feet wide by 14 feet high, which UI will install at the north end of the substation. This enclosure will house the protective relaying and control equipment as well as the battery and charger associated with the transmission and distribution equipment. The design of the substation allows for expansion to three transformers. (UI 1, p. 21; Tr. 1, p. 48-49).

33. Within the substation footprint, UI will remove any catch basins or containment pits which had been installed while the Lord manufacturing facility was in operation. UI will install infiltration basins designed for stormwater to run off the property and ultimately distribute it into the grass and vegetation that either currently exists or will be planted. (Tr. 1, pp. 19-20).

34. Based on hydraulic analysis of the Far Mill River in the vicinity of the UI property and the substation design, the substation is not expected to affect the flood storage capacity of the one percent annual chance floodplain[1] or the conveyance capacity of the one percent annual chance floodway. While it is UI's standard to put a control room floor and any electrical equipment one foot above the one percent annual chance flood elevation, for this Project, UI will locate the control room floor, as well as any critical electrical equipment, one foot above the 0.2 percent annual chance FEMA floodplain elevation[2] as it is published by FEMA today.[3] (UI 1, p. 49; Tr. 1, p. 27, 28, 55, 92).

35. UI will install high mast lights along the substation fence line. These shielded fixtures will direct the light down in a cone and will focus the light within the boundaries of the substation. (Tr. 1, p. 35).

36. A 90-foot wooden pole will be installed approximately 8 feet into the ground with an antenna extending the top. It will serve to enable radio communications for electronic meter reading, as well as communication with electric devices on the distribution system. (Tr. 1, p. 37).

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[1] The one percent annual chance flood is also referred to as the base flood or 100-year flood.

[2] The 0.2 percent annual chance flood is also referred to as the 500-year flood.

[3] UI's hydraulic analysis consultants, Milone and MacBroom, Inc. (MMI) discovered that FEMA's assessment of the one percent annual chance floodplain and floodway, as published in the New Haven County Flood Insurance Rate Study dated June 2010, is out of date and requires revision. As a result, the actual flood elevations on the Project site are incorrect and not as high as indicated on FEMA mapping. For example, the FEMA modeling mapping assumes the presence of the former Lord manufacturing facilities on the Project site (all of which have been removed) and also assumes the location of the Far Mill River as it existed prior to DOT's construction of State Route 8. (DOT moved a portion of the river for the highway construction.) To modify the FEMA maps of the Far Mill River, the City of Shelton would have to petition FEMA. UI will provide the City with MMI's hydraulics report to assist the City in this process. (UI 7, p.9, 11; Tr. 1, p. 25).

37. CL&P's existing transmission lines are routed north to south across the western portion of the Project site. The centerline of the easternmost line is approximately 15 feet west of the western boundary of the proposed substation site. On the UI property, the existing transmission line will be rerouted into the substation by installation of four new steel monopoles. These monopoles, installed to connect the substation to the existing transmission line, will be similar in height to the 81-foot-tall lattice tower transmission structures that support CL&P's 115-kV transmission lines. UI will establish the interconnections between the substation and the new transmission line poles by installing two new line-terminal structures (approximately 48 feet in height) within the substation. UI will convey the ownership of the two monopoles that are within the right-of-way to CL&P and UI will maintain ownership of the remaining two. (UI 1, pp. 21-22; UI 7, pp. 5-6; Tr. 1, p. 89).

38. To access the proposed substation, UI will upgrade the existing access road that presently extends into the site from Pootatuck Place. The upgraded access road will have a travel surface of approximately 20 feet, and will be extended into the substation to provide direct ingress and egress to the station equipment and buildings. (UI 1, p. 22).

39. The two-acre substation site will be covered with a trap rock surface and surrounded by an eight-foot-high chain link fence, topped with one foot of barbed wire (three strands). The existing chain link fence around the perimeter of the six-acre UI property will be removed. Fencing around the property will be installed as illustrated on the Site Plan, and will allow for public access to the riparian corridor along the Far Mill River. ((UI 1, p. 19; UI 7, Attachment A; Tr. 1, pp. 12-15)

40. Development of the proposed substation will require protective relay system changes within the existing control enclosures at remote substations. These upgrades are required for the safe and proper operation of the proposed substation. To provide protective relay communications, UI will install a fiber optic cable along an existing overhead distribution line between the proposed substation and the Trap Falls Substation (approximately 0.8 mile away) and between the proposed substation and a splice location on a wood distribution pole on the corner of Old Stratford Road and Bridgeport Avenue in Shelton. (UI 1, p. 22).

41. UI will install a concrete-lined oil containment pit under each transformer. Dewatering of the pits for rain or any moisture will go through a gravity controlled petro barrier system, *i.e*., a system that has beads that swell in the presence of any oil to prevent oil from discharging. Drainage from these pits will be taken to the infiltration basin. The minimum volume of these pits will be 110 percent of the transformer volume. (Tr. 1, pp. 50-51).

42. To deliver power from the substation into UI's distribution system in the Shelton region, UI will install new distribution infrastructure from the substation to interconnect with the existing distribution network both north and south of the substation. The get-away from the substation for these distribution circuits will consist of duct lines and splicing chambers, which will be buried beneath local roads. (UI 1, p. 27).

43. The distribution circuit get-away from the Shelton Substation will consist of two PVC underground duct lines that will extend from the substation to two new splicing chambers that will be located beneath Old Stratford Road. One duct line will exit the substation site through the property in front (i.e., south) of the substation directly onto Old Stratford Road, while the other duct line will exit the site to the west of the substation onto Pootatuck Place and will continue to Old Stratford Road. (UI 1, p. 27).

44. From the splice chambers on Old Stratford Road, new distribution duct lines will be aligned: (i) for approximately 1,150 feet northwest beneath Old Stratford Road to an interconnection with UI's existing distribution system located beneath Bridgeport Avenue; and (ii) for approximately 800 feet southeast beneath Old Stratford Road to the east side of the State Route 8 bridge crossing on Old Stratford Road. (UI 1, pp. 27-28).

45. In addition to the new distribution duct lines, an estimated eight new splicing chambers will be required within Old Stratford Road and Bridgeport Avenue. UI will install underground laterals from these new splicing chambers along Old Stratford Road to allow the new cables to rise to open wire or aerial cable. (UI 1, p. 28).

46. The service life of the substation equipment is expected to be 40 years or more. (UI 1, p. 22).

47. Vehicles can access the site via the existing access road to the property off Pootatuck Place. Existing on-site roads will be improved or extended to provide access directly to the substation. (UI 1, p. 19).

48. The substation's footprint, as proposed in the Application, will occupy an irregularly shaped area of 84,159 square feet, measuring approximately 374 feet by 258 feet at its longest dimensions. (UI 1, p. 19; UI 7, Attachment A).

49. The anticipated in-service date is December 2014. (UI 1, p. 73).

50. The estimated siting, design, and construction cost of the proposed facility is:

Materials & Equipment	$16,300,000
Land	$ 4,000,000
Permitting, Engineering, and Construction Management	$ 7,800,000
Construction	$10,200,000
Total	$38,300,000

(UI 1, p. 73)

Environmental Considerations

Topography, Geology and Soils

51. The substation site is relatively flat and, as a result, minimal grading will be required. No blasting will be required for construction of the facility. UI will import additional soils and fill materials to raise the average site elevation in accordance with the Project plans. (UI 1, p. 47).

Water Resources and Floodplains

52. Although the six-acre property borders the Far Mill River and Black Brook (which is located on DOT property east of UI's land), the two-acre substation site is situated in an upland, except for a 0.17-acre wetland that has developed over a former asphalt parking lot. Consultations and a field visit conducted with the U.S. Army Corps of Engineers (ACOE) in 2012 confirmed that the wetland is subject to federal jurisdiction, as well as state jurisdiction. (UI 1, pp. 32-33, 35)

53. DEEP has classified the groundwater at the site as GB, presumed not suitable for human consumption without treatment. This classification reflects the past industrial use of the site. The Aquarian Water Company provides potable water for Shelton. (UI 1, pp. 35-36).

54. The construction and operation of the Shelton Substation will not affect the water quality or the forested riparian areas along the Far Mill River or Black Brook. With the exception of the 0.17-acre wetland, construction activities will be confined to upland areas of the property. (UI 1, p. 48).

55. The development of the substation will not adversely affect the flood storage capacity of the Far Mill River. (UI 1, p. 49; UI 7, pp. 9, 11).

56. UI will implement appropriate spill prevention, control, and countermeasure procedures during construction (to minimize the potential for inadvertent spills or leaks from construction equipment and to define procedures to promptly clean up any spills that do occur) and during operation of the facility (e.g., to avoid or minimize the potential for spills or leaks from substation equipment). (UI 1, p. 49).

57. During the construction of the substation, areas of disturbed soils and spoil piles will be protected with appropriate erosion and sedimentation controls in order to avoid the potential for sedimentation into the Far Mill River or Black Brook. Construction activities will conform to UI's *Soil Erosion and Sediment Control Plan* and *Spill Prevention Plan*, as well as the requirements of the DEEP *General Permit*. (UI 1, pp. 48-49).

Vegetation and Wildlife

58. The development of the substation will involve the removal of all existing vegetation within the footprint of the proposed substation facilities. The substation yard will replace the scrub-shrub and herbaceous vegetative

communities that currently characterize portions of the site, and the wildlife species that presently utilize the site will be displaced. (UI 1, p. 49).

59. Other herbaceous and scrub-shrub communities are present in the vicinity of the site and can be expected to provide habitat for the displaced wildlife species. Further, the site was historically developed for industrial purposes and thus the wildlife habitat that does exist is relatively newly established. While the development of the substation will represent a long-term change in on-site vegetation and wildlife, the overall effect will be minor and localized. (UI 1, p. 49).

60. Development of the substation will not affect the forested vegetation along the Far Mill River and Black Brook. As a result, no adverse effects to the species of fish and wildlife that utilize the river corridor are expected to occur. Vegetative buffers along Old Stratford Road and Pootatuck Place will be retained to the extent possible and also will continue to provide bordering wildlife habitat. (UI 1, p. 50).

61. There are no known existing populations of federal- or state-listed endangered or threatened species, or any state special concern species in the vicinity of the proposed site. (UI 1, Appendix B, Letter from DEEP dated February 15, 2012).

Land Use and Recreation

62. The development of the substation will convert a vacant brownfields site to productive purpose and will be consistent with the historical industrial use of the site and with local zoning. The site also is relatively isolated from nearby commercial uses and will not affect any designated or planned recreational uses. (UI 1, p. 50-51).

63. The City of Shelton has designated the Fall Mill River as a "conceptual greenway corridor" and a trail is identified as planned for location along the northern bank of the river, opposite UI's property. However, the construction and operation of the proposed substation will not affect the riparian corridor along the Far Mill River and thus will not affect the use of this trail (if developed) for recreational purposes.[4] (UI 1, p. 51).

Cultural Resources

64. There are no known and recorded historic and archaeological sites on or near the proposed substation site. The Connecticut State Historic Preservation office (SHPO) has indicated in a written response that the Project as presently planned

[4] As part of consultations regarding options for mitigation for filling the 0.17-acre wetland on the substation site, UI has engaged in discussions with the City of Shelton, DEEP and the ACOE regarding the preservation of the Far Mill River riparian area on UI's property, including the provision of public parking on UI property along the river at the end of Pootatuck Place and public access to the Far Mill River. Preservation options include the possibility of maintaining the parking area and/or UI bequeathing the property to the City. While communication on these issues continues, no final determination has been made at this time. (Tr. 1, p. 83-84; UI 7, p. 11).

will have no significant adverse effects on cultural resources. All construction activities associated with the proposed substation will take place in areas previously developed for industrial use, where soils have already been extensively disturbed. As a result, the potential for encountering intact, previously unrecorded, significant archaeological resources is negligible, and UI anticipates no adverse effects on cultural resources to occur. In the unlikely event that prehistoric archaeological and/or historic resources are discovered during construction of the substation, UI will stop work in the immediate area and notify the SHPO. (UI 1, p. 52; UI 1, Appendix B, Letter from SHPO dated June 28, 2012).

Noise and Lighting

65. The construction of the Shelton Substation will cause temporary increases in sound levels on and in the vicinity of UI's property as a result of activities such as the operation of construction equipment and vehicles. However, because the site is located adjacent to a commercial area, Old Stratford Road, and State Route 8, these temporary increases in noise will generally be consistent with other uses in the vicinity. There are no schools or residential neighborhoods in the immediate vicinity of the site. Typical construction activities will take place between 7:00 AM and 5:00 PM, Monday to Friday. (UI 1, p. 53).

66. After the substation becomes operational, infrequent impulse noise will be generated from switching and circuit breaker opening and closing. The impulse noise levels and steady-state transformer noise levels will not exceed the levels permitted by the City of Shelton's noise control regulations during normal operating conditions. The operation of the substation will cause less than perceptible increases to the ambient sound level at the nearest noise-sensitive receptor (*i.e*., a residence located 470 feet from the property boundary). Further, the sound levels associated with the substation will not exceed the limits for adjacent noise classes identified in the City of Shelton noise ordinance and in State noise regulations. (UI 1, p. 53; UI 1, Appendix D, Noise Assessment; UI 7, p. 4).

67. The construction of the proposed substation may require some security lighting that may be visible from nearby commercial areas or from adjacent portions of Old Stratford Road and Pootatuck Place. During operation, the substation will have low-level lighting for safety and security purposes. The illumination from these lights will be visible only in the immediate vicinity of the substation, such as along Old Stratford Road near the site and from Pootatuck Place. UI will utilize other types of lighting only for work at night under abnormal or emergency conditions. (UI 1, pp. 53-54).

Environmental Remediation

70. Prior to the purchase of the six-acre property in 2009, UI consulted with the former property owners and conducted a due diligence analysis. The substation will be developed on portions of the former industrial site that have already undergone environmental remediation. Substation construction activities will not adversely affect active groundwater monitoring wells or the ongoing groundwater

remediation effort that is being performed on behalf of Lord. (UI 1, Vol. I, p. 54; UI 7, p. 7; Tr. 1, p. 38, 42).

71. Some groundwater wells will be relocated outside the substation site prior to the start of substation construction. (Tr. 1, pp. 42-43).

Visibility

72. Year-round views of the substation yard will be confined to locations on and within the immediate area of the site and extend approximately 500 feet south and westward. The tops of taller structures associated with the facility may be visible from some locations to the west and north for distances of up to approximately 1,000 feet. However, looking south along CL&P's transmission line corridor, the substation may be visible from an estimated 0.25 mile or more. This may result because CL&P maintains its corridor in low-growth vegetation, consistent with overhead transmission line operation. Views to the east are shielded by the elevated Route 8 corridor, where limited views of the tallest structures might be seen intermittently by passing motorists in the immediate area of Exit 12, near the site. Similarly, the tops of the tallest of the proposed structures (those above 60 feet) may be visible above the trees and from portions of Old Stratford Road as it extends southeastward approximately 1,500 feet beyond Route 8. Views to the south are limited to portions of the parking lot at the Split Rock Plaza Center, which is separated visually by either dense tree cover or the cut of the hill itself. (UI 1, Appendix E, p. 2).

73. Additional areas have the potential to offer some views of the substation through the trees during "leaf-off" conditions. Most of this seasonal visibility appears limited to within approximately 1,500 feet of the proposed substation. Taller structures may be seen through the trees from up to approximately 500 feet beyond those areas where year-round visibility is anticipated. (UI 1, Appendix E, p. 2; Tr. 1, pp. 34-35).

Electric and Magnetic Field Levels

74. At a distance of 100 feet from the substation perimeter, the calculated electric- and magnetic-field (EMF) levels are similar to or lower than those measured or calculated for pre-construction activities. (UI 1, p. 57).

75. The calculated magnetic-field levels in the vicinity of the proposed substation are comparable in magnitude to the magnetic-field levels encountered in the vicinity of typical distribution lines and in homes and workplaces. (UI 1, p. 61).

76. The highest calculated magnetic-field level at the perimeter of the substation fence is less than three percent of the International Commission on Non-Ionizing Radiation Protection (ICNIRP) limit (and less than 0.5 percent of the International Commission on Electromagnetic Safety (ICES) limit) recommended for exposure of the general public and is comparable to fields that may be found in homes near major appliances. (UI 1, pp. 58, 59, 61).

77. The proposed substation will be far enough from the nearest residence, approximately 500 feet away, that it will likely have no effect on the background EMF levels. (UI 1, p. 62).

78. The proposed substation's location and design is consistent with the Council's Best Management Practices for Electric and Magnetic Fields. (UI 1, p. 60).

79. International health and safety agencies, including the World Health Organization (WHO), IARC, and ICNIRP, have evaluated the scientific evidence regarding possible health effects from magnetic fields (MF) produced by non-ionizing, low-frequency 60-Hertz alternating currents in transmission lines. The ICNIRP and ICES have proposed quantitative guidelines for magnetic fields to prevent non-hazardous nerve stimulation. The limit recommended by ICNIRP in 1998 was 833 mG, and was revised upward in 2010 to 2,000 mG.. The ICES (2002) limit for the general public, developed from a similar database and slightly different assumptions, is 9,040 mG. Neither the State of Connecticut nor the federal government has adopted exposure limits for magnetic fields. (Council Administrative Notice Item No 10; UI 1, p. 59, 60).

Safety and Reliability

80. The perimeter of the substation will be enclosed by an eight-foot-high chain link fence topped with an additional one foot of three strands of barbed wire to discourage unauthorized entry and/or vandalism. The substation entrance will be gated and locked. Appropriate signs will be posted at the substation fence and gates, alerting the general public to the presence of high-voltage facilities. Lighting will be available within the substation yard to facilitate work at night or during inclement weather. UI will install devices to constantly monitor the substation to alert UI of any abnormal or emergency situations. (UI 1, p. 29-30).

81. UI will equip the substation to ensure continued service in the event of outages or faults in transmission or substation equipment. Continued reliability will be achieved by incorporating a "loop through" design configuration for the existing 115-kV overhead transmission line, transformer protection, and redundant automatic protective relaying equipment. (UI 1, p. 28).

82. In the event that an energized line or 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. Protective relaying equipment will be provided to automatically detect abnormal system conditions (*e.g.*, a faulted overhead transmission line) and will 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. (UI 1, p. 28).

83. The protective relaying and associated equipment, along with a Supervisory Control and Data Acquisition (SCADA) system for 24/7 remote control and equipment monitoring at UI System Operations Center, will be housed in a

weatherproof, environmentally controlled electrical equipment enclosure. (UI 1, p. 28).