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-kV/13.8-kV Electric Substation and Associated Facilities Located at 3-7 Wildflower Lane, Trumbull Connecticut	)	Docket 317
	)	January 4, 2007

Proposed Findings of Fact

Introduction

1. The United Illuminating Company (UI), 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 (Council) on June 30, 2006 for the construction, operation, and maintenance of a new substation to be located on UI's 4.85-acre property located at 3-7 Wildflower Lane, Trumbull, Connecticut. (UI 1, Vol. I, 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 Town of Trumbull and surrounding communities. (UI 1, Vo1. I, p. 2).

3. The parties in this proceeding are UI, the Wildflower Coalition Petitioners, and the Town of Trumbull. The Connecticut Light and Power Company and Mark Waggner are intervenors. (Transcript 1 – 10/24/06 at 3:00 p.m. [Tr. 1], pp. 5-6).

4. Pursuant to General Statutes § 16-50m, the Council, after giving due notice thereof, held a public hearing on October 24, 2006, beginning at 3:05 p.m. and continued at 7:10 p.m. The hearing was noticed for the Trumbull Town Hall, the Court Room, 2nd floor, 5866 Main Street, Trumbull. However, the location was changed to the Madison Middle School, 4630 Madison Avenue, Trumbull prior to the hearing. (Council's Revised Hearing Notice dated October 12, 2006 (original notice dated September 22, 2006); Tr. 1, p. 3; Transcript 2 – 10/24/06 at 7:00 p.m. [Tr. 2], p. 3).

5. The hearing continued on October 26, 2006 at 10:20 a.m. and on December 5, 2006 at 10:30 a.m. at the Offices of the Council, Ten Franklin Square, New Britain. (Transcript 3 – 10/26/06 at 10:20 a.m. [Tr. 3], p. 3; Transcript 4 – 12/5/06 at 10:30 a.m. [Tr. 4], p. 3).

6. The Council and its staff made an inspection of the proposed substation site on October 24, 2006 beginning at 1:00 p.m. (Council's Revised Hearing Notice dated October 12, 2006; Tr. 1 at 4).

7. The Council and its staff also inspected the Quail Trail site (Site 6) and the Quarry Road site (Site 11). (Tr. 1 at 4).

8. Pursuant to CGS § 16-50*l* (b), public notice of the application was published in *The Trumbull Times*, *The Bridgeport News*, and *The Stratford Sun* on June 22, and 29, 2006. (UI 1, Vol. II, Exh. H; UI 4, response 1 and attachments).

9. Pursuant to CGS § 16-50l(b), notice of the application was provided to all abutting property owners by certified mail. (UI 1, Vol. II, Exh. H; UI 4, Response 1 and attachments).

10. UI erected a sign, measuring four feet by six feet, on its property on Wildflower Lane, close to Huntington Turnpike, which provided a brief description of the docket and notice of the Council's October 24, 2006 hearing. The sign also indicated that a copy of the application and additional information is available at the Council's website or by calling the Council. An identical sign was placed on Nichols Avenue near the current access road to the substation site. The sign on Wildflower Lane was installed on October 10, 2006 and the sign on Nicholas Avenue was installed on October 12, 2006. UI 7.

11. UI obtained permission from the owner of the Site 6 property, the Town of Trumbull, and installed four (4) signs on Site 6 on October 12, 2006. The signs provided a brief description of the docket and notice of the Council's October 24, 2006 hearing. The sign also indicated that a copy of the application and additional information is available at the Council's website or by calling the Council. UI 7.

12. Pursuant to CGS § 16-50*l*(b), UI provided notice to all federal, state and local officials and agencies listed therein. (UI 1, Vol. II, Exh. H).

13. On or about June 30, 2006, UI sent copies of its application to the Connecticut Energy Advisory Board (CEAB). (UI 1, Vol. II, Exh. H).

14. On July 14, 2006, the CEAB issued a Request for Proposals (RFP) seeking alternatives to the proposed substation, pursuant to CGS § 16a-7c. (Council Admin. Notice, Item 33).

15. On October 26, 2006 the CEAB issued its final report indicating that the proposed Trumbull substation is "a reasonable approach to the resolution of concerns about distribution level reliability in the Trumbull area." (Council Admin. Notice, Item 33).

State Agency Comment

16. Pursuant to CGS § 16-50*l*, on September 22, 2006, the following State agencies were solicited by the Council to submit written comments regarding the proposed

facility: Department of Environmental Protection (DEP), Department of Public Health (DPH), Council on Environmental Quality (CEQ), Department of Public Utility Control (DPUC), Office of Policy and Management (OPM), Department of Economic and Community Development (DECD), and the Department of Transportation (DOT). (Record).

17. The Council received responses from the DOT's Bureau of Engineering and Highway Operations on October 13, 2006, and from the DEP on October 20, 2006. (Record).

18. DEP comments that the only DEP permit the facility would require is an NPDES Discharge Permit for Stormwater Associated with Construction Activities. Since the project would likely disturb between one and five acres, the Town of Trumbull would review the stormwater management plans for this construction activity. (DEP Comments dated October 20, 2006, p. 5).

19. DEP also notes that a check of the DEP Natural Diversity Database confirms that there are no listed species at the proposed or alternate sites. (DEP Comments dated October 20, 2006, p. 6).

20. DPH responded that it had no comments. (Hearing Program, October 24, 2006 hearing, ¶ E).

Municipal Consultation

21. UI met with Trumbull officials and residents prior to the start of the municipal consultation process on December 1, 2005, including an October 2002 meeting attended by Trumbull's Planning and Zoning Administrator, First Selectman Raymond J. Baldwin, and UI's consultants. (Record).

22. UI notified the Town of Trumbull of the proposal on November 28, 2005 by sending technical reports to First Selectman Raymond J. Baldwin. UI also consulted with First Selectman Baldwin prior to the submission of the report. UI notified the City of Bridgeport of the proposal on December 21, 2005 by sending technical reports to Mayor John M. Fabrizzi. UI notified the Town of Stratford of the proposal on December 21, 2005 by sending technical reports to Mayor James Miron. (UI 1, Exh. G).

23. On June 30, 2006, UI filed an application with the following municipal agencies: Trumbull Inland Wetlands & Watercourse Commission, Bridgeport Zoning Department, Bridgeport Regional Planning Agency, Stratford Planning and Zoning Administrator, Stratford Inland Wetlands & Watercourse Commission, Trumbull Planning and Zoning Administration, Trumbull Engineering Department, Bridgeport Office of Planning / Economic Development, Bridgeport Inland Wetland Agency, Stratford Zoning Commission, and Stratford Conservation Commission. (UI 1, Exh. H).

24. On July 19, 2006, the Trumbull Planning and Zoning Commission held a meeting and voted unanimously to deny UI's proposal for the location and construction of

the substation. On July 24, 2006, the Commission informed UI by letter of this result. (Record).

25. On August 9, 2006, UI responded by letter, stating that UI had not been informed about the meeting of the Trumbull Planning and Zoning Commission and is willing to meet with the Commission and respond to its concerns about the substation. (UI 3).

Need

26. The Trumbull Substation is needed to maintain reliability of electric service to customers and to support customer need in the Trumbull region. Construction of the substation will eliminate the growing risk of overloads and associated load shedding and thereby maintain the overall system reliability in the greater Trumbull area. Without the addition of a new substation, the greater Trumbull area is at risk of rolling blackouts if a failure results in a transformer being out of service during periods of peak demand. (UI 1, Vol. I, p. 2, 7, 23; UI 6, p. 3).

27. UI currently has no substation in Trumbull. Two substations serve Trumbull: Trap Falls Substation in Shelton and Old Town Substation in Bridgeport. Old Town and Trap Falls Substations supply over 95 percent of Trumbull's electric demand and provide electric service to approximately 85 percent of Trumbull's customers. (UI 1, Vol. I, pp. 2, 5, 23).

28. These substations are currently operating over or near capacity. During the summer of 2005, the Old Town Substation reached a loading level of 83.3 MVA, which is 97% of its maximum rated capacity of 86.5 MVA, and the Trap Falls Substation reached a loading level of 77.3 MVA, which is 101% of its maximum rated capacity of 76.5 MVA. In the summer of 2006, the Old Town and Trap Falls Substations exceeded their ratings by 6 MVA each and operated above their respective ratings on four days each, for a total in 2006 of 24 hours for Trap Falls and 20 hours for Old Town. After the summer peak of 2007, it is expected that these substations will no longer be able to meet the capacity needs of the growing load in the greater Trumbull region. The construction of Trumbull Substation will provide the needed capacity to support customer loads in the greater Trumbull region. (UI 1, Vol. I, pp. 2, 5, 23; UI 6, p. 3; UI 13, response 2).

29. In the summer of 2006, the UI system experienced multiple new peaks and both the UI system, and the New England system set peak demand records that far exceeded planning projections. UI expects the proposed substation to provide the distribution capacity in the greater Trumbull area necessary for UI to serve the growing load reliably. UI further expects that the substation will allow UI to meet the growing capacity requirements of this area while remaining in compliance with UI's design criteria. UI's design criteria stipulate that a substation must be able to serve load at or below the substation's rating under a single contingency (loss of one component/N-1). (UI 1, Vol. I, p. 2; UI 6, p. 3).

30. With the new Trumbull Substation, approximately 18 MVA of load from Old Town Substation and approximately 17 MVA of load from Trap Falls Substation (35 MVA total) can be transferred permanently to the new substation. This

eliminates the overload concerns at both existing substations and provides a capacity margin of 23 MVA for future growth in the greater Trumbull region. (UI 1, p. 8).

31. Over the past several years, the Company has utilized distribution load transfers to defer construction of the Trumbull Substation. UI's ability to use distribution load transfers to solve Trumbull's capacity needs in a cost effective manner have been exhausted. (UI 1, Vol. I, pp. 7-8, 23; UI 9, response 11).

32. UI projects that, without relief, temporary measures will need to be taken in the summer of 2007 to cascade load from Trap Falls and Old Town to other neighboring substations if loads approach their forecast levels. Cascading load in this manner reduces system performance and reliability by increasing feeder lengths and degrading voltage levels. Although these temporary load transfer measures are expected to allow UI to continue to provide service to customers in the short-term while the substation is being constructed, these measures are unsustainable in the long-term. (UI 1, Vol. I, p. 8, 24).

Site Alternatives

33. UI reviewed and evaluated a total of sixteen sites (some of which are different locations on a single parcel). (UI 1, Vol. I, pp. 35-53).

34. In its site evaluations, UI used the following criteria to judge a particular location's viability: transmission and distribution considerations; substation construction and access considerations; environmental considerations; and real estate considerations. (UI 1, Vol. I, pp. 35-53).

35. The sixteen sites evaluated were: the proposed substation site at 3-7 Wildflower Lane (Site 1); Connecticut Route 8 (Site 2); 2878 Nichols Avenue (Site 3); Huntington Turnpike (Sites 4A and 4B); 1446 Huntington Turnpike (Site 5); Rocky Ridge Road (Sites 6A, 6B, 6C, and 6D); 330-336 White Plains Road (Site 7A); 364 White Plains Road (Site 7B); Unity Park (Site 8); Huntington Turnpike (Site 9); 1460 Huntington Turnpike (Site 10); and Quarry Road (Site 11). (UI 1, Vol. I, pp. 39-40).

36. UI systematically compared the proposed site with the alternative sites listed above. UI conducted this comparison in two distinct phases, a preliminary phase and a more detailed phase. The pastor of the Armenian Church of the Holy Ascension, Inc., suggested Site 10, while the residents of Stella Street and Wildflower Lane, members of the Trumbull Town Council, and the First Selectman suggested Site 11 during the municipal consultation process. After UI completed its formal site evaluation process, UI agreed to examine a new location for placing the substation on Site 6 (Site 6D), as Wildflower Lane residents and Trumbull town officials suggested to UI during a meeting on May 10, 2006. (UI 1, Vol. I, p. 40 & n.6).

37. With respect to transmission and distribution considerations, UI determined that the proposed site: is located at the junction of two major transmission lines in southwest Connecticut; is best suited for both transmission and distribution

system access; is the only site that does not require new dead end tap structures since it can tap directly into the existing UI 1730 transmission line; will require no distribution ductline ROW to exit the substation property and meet the public ROW on Wildflower Lane; requires the least amount of ductline construction of all the alternatives; has the lowest combined total transmission and distribution costs of all the evaluated sites; meets the Trumbull region's long-term electric infrastructure needs; provides access to the existing overhead distribution line on the Connecticut Light and Power (CL&P) ROW like the other evaluated sites; and, like every site situated south of the CL&P 1730 transmission line, requires a line crossing structure. (UI 1, Vol. I, pp. 36-37).

38. With respect to substation construction and access considerations, UI determined that vehicles can access the proposed site directly by existing street frontage on Wildflower Lane, and, unlike other sites, does not require the construction of access roads to the substation. Further, UI determined that the proposed site requires the least preparation and development work, as compared to the other locations, due to its advantageous topography and existing improvements. (UI 1, Vol. I, p. 37).

39. With respect to environmental considerations, UI determined that there are no wetlands or streams on or adjacent to the proposed site. In addition, UI determined that the proposed site minimizes environmental disturbances in requiring neither the construction of access roads nor the relocation of the distribution line to the north of the CL&P ROW, and due to the existing CL&P transmission line support structure and a UI transmission switching structure. Finally, UI determined that although there are two residences near the proposed site with otherwise unobstructed views (as well as other nearby residences with seasonally obstructed views), the proposed site has adequate area to provide visual screening. UI proposes using mature plantings around the outer perimeter of the substation to mitigate the visual effects of the substation project. One residence, to the northwest of the existing ROW, will have an unobstructed view of a new transmission structure. (UI 1, Vol. I, pp. 37-38; UI 6, p. 6).

40. With respect to real estate considerations, UI is the current owner of the proposed site and thus requires no additional land or access ROWs, eliminating the expenditures and uncertainties that accompany real estate transactions or property condemnation. All of the other identified sites require the purchase of property and the acquisition of land rights for the associated ROW. (UI 1, Vol. I, pp. 38; UI 6, p. 6).

41. UI determined that substation construction on the proposed site will cost at least $1.4 million less than at each of the other identified sites. (UI 1, Vol. I, pp. 38).

42. To achieve the distribution capacity benefit of the proposed site, Site 11 would require an additional 2.4 miles of distribution construction, and future circuits routed in a northeasterly direction would also require additional cost and reliability exposure. Site 11 also requires roughly two to three times the amount of equipment to feed the distribution as compared to that of the proposed site. The owner of Site 11 recently offered to sell the property to UI for $7.5 million. This figure does not include potential environmental remediation costs. UI determined that the cost differential to achieve the distribution capacity benefit at

Site 11, as compared to the proposed site, is $11.6 million. (Tr. 4, pp. 33-39, 45 (testimony of Charles Eves and Richard Reed); UI 14, pp. 1-11).

43. To achieve the transmission reliability benefit of the proposed site, Site 11 would require breaking up the existing three-terminal 1730 line into three independently protected lines and extending the transmission line west to the proposed site along either a 1.4- or 2.4-mile route. These potential routes include overhead or underground along a CL&P ROW, or underground along city roads to Quarry Road. UI determined that the cost differential to achieve the transmission reliability benefit at Site 11, as compared to the proposed site, is $3.2 - 23.7 million. (Tr. 4, pp. 39-45 (testimony of Charles Eves); UI 14, pp. 1-11).

44. At the curb at the end of the cul-de-sac on Wildflower Lane (Point D-1), the EMF differentials that UI calculated for a substation twenty feet north of the proposed site under current conditions (post-Bethel/Norwalk project, but pre-Middletown/Norwalk project) are decreases from 1.4 mG to 1.3 mG for a normal load (15 GW) and from 2.5 mG to 2.4 mG for a peak load (27 GW). For post-Middletown/Norwalk project, beginning in approximately 2010, UI calculated differentials of 1.0 mG to 0.9 mG for a normal load (15 GW) and 1.7 to 1.5 for a peak load (27 GW). (Tr. 4, pp. 47-50 (testimony of Charles Eves, Kathleen Shanley, and Michael Silva); UI 14, pp. 13-14).

45. UI calculated the following differentials in noise levels due to moving the substation twenty feet north of the proposed site: an increase in 1 dBA for 1500 Huntington Turnpike; a decrease of 0.9 dBA for 6 Wildflower Lane; and a decrease of 0.7 dBA for 45 Stella Street. (Tr. 4, pp. 53 (testimony of Charles Eves); UI 14, pp. 12-13; UI 14, p. 12).

Description of Proposed Project

46. The proposed project would be located on a 4.85-acre parcel of land at 3-7 Wildflower Lane, Trumbull, immediately west of the Connecticut State Route 8/Nichols Avenue (State Route 108) interchange. The property is situated off a cul-de-sac at the easterly terminus of Wildflower Lane within a triangular area bounded by Huntington Turnpike, Nichols Avenue and Route 8 in Trumbull. The junction of UI's 1710 and 1730 transmission lines with CL&P's 1710 and 1730 lines occurs at the proposed site. (UI 1, Vol. I, pp. 14, 63).

47. There are currently two transmission structures on the site, one of which includes two sets of motor-operated disconnect switches that allow the lines to be sectionalized after a fault. Over half of the proposed site is within UI's existing transmission line ROW. UI's existing transmission line ROW and switch structure border the eastern section of the site. UI's ROW is 200 feet wide and supports its 115-kV transmission lines (1710 and 1730) on a double circuit monopole structure in a vertical configuration and a double circuit switch lattice structure in a horizontal configuration. CL&P's existing transmission line ROW borders the northern portion of the site. CL&P's ROW is 110 feet wide and supports CL&P's 115-kV transmission lines (1710 and 1730) on lattice structures in a vertical configuration. (UI 1, Vol. I, p. 14).

48. The proposed substation will consist of an outdoor, air-insulated, low profile 115-kV switchyard and includes the following equipment: two 24/32/40 MVA, 115/13.8-kV power transformers with load tap changers; one 13.8-kV bus duct system connected to the power transformers; low profile 115-kV aluminum tubular bus work supported by station post insulators; three 115-kV SF6 gas insulated circuit breakers; five vertical break disconnect switches; six center break disconnect switches; instrument transformers; three tubular steel H-frame takeoff structures within the fenced switchyard; miscellaneous steel structures for equipment and bus work support to be installed on concrete-filled drilled pier foundations; five shielding masts for lightning protection; one control/switchgear building; and two single pole tubular steel dead-end structures. (UI 1, Vol. I, p. 15).

49. The project includes the construction of a single-story prefabricated metal control/switchgear building on the western edge of the proposed site. The 13.8-kV metal-clad switchgear, the protection, control and metering equipment and the alternating current (AC) and direct current (DC) power equipment will be located in the control/switchgear building. The building height will be approximately fifteen feet above grade. The building, transformers, circuit breakers, and station post insulators will be specified with an American National Standards Institute (ANSI) light gray exterior color. (UI 1, Vol. I, p. 15).

50. The proposed substation's lightning shielding masts will extend approximately 55 feet above grade, and the takeoff structures will extend approximately 48 feet above grade. The three takeoff structures will be designed as tubular steel H-frame structures. The switchyard high voltage (115 kV) bus will be approximately 26 feet above grade. A new single pole tubular steel dead-end structure, located within the substation fenceline, will be approximately 75 feet above grade. A second new single pole tubular steel dead-end structure will be approximately 85 feet above grade and will be located within CL&P's existing transmission line ROW. (UI 1, Vol. I, p. 16).

51. No additional ROW or other property acquisition will be required to complete the proposed substation. The configuration of the UI 1710 line will remain unchanged. (UI 1, Vol. I, pp. 16, 21).

52. The proposed site's location at the junction of CL&P's east/west section and UI's north/south section of the 1730 line will enable UI to break down the existing three terminal 1730 line into three two terminal lines without significant investment in transmission infrastructure to route the junction to a new site. The existing three terminals are located at Devon, Pequonnock and Weston. Sectionalizing the transmission line this way provides a reliability benefit by reducing the overhead transmission line exposure to outages for roughly half of the customers fed from the new Trumbull Substation from 20.4 miles to 12.6 miles. (UI 1, Vol. I, p. 17).

53. By breaking down the tap on the 1730 line into three two-terminal transmission lines, UI will create an alternative path for power flow. This increases the opportunity to conduct maintenance on the greater Trumbull area 115-kV lines without unacceptably impairing the capacity or reliability of the system. (UI 1, Vol. I, p. 18).

54. The existing UI 1730 transmission line will be routed into and out of the proposed substation. The proposed design will break down the existing three terminal tap on the 1730 line and will effectively create three transmission lines from the existing 1730 line. These new lines will be created by adding 115-kV breakers at the north-south and east-west junction of the 1730 line. The transmission lines will be re-numbered after the substation is completed. The substation will have a 3-position ring bus that is fed by three 115-kV transmission lines. Line 1714 to Weston and line 1730 from Devon (Milford) will enter the substation from the north, and line 1697 to Pequonnock (Bridgeport) will enter the substation from the south. (UI 1, Vol. I, p. 18).

55. From the existing tap structure (833A) in CL&P's ROW, CL&P's 1730 transmission line will be routed south for approximately 115 feet to one of the two proposed takeoff structures inside of the north side of the substation. The line will be routed through a sectionalizing circuit breaker and then exit the proposed substation through the second takeoff structure inside the substation. To reconnect to CL&P's transmission line, the line will span approximately 115 feet from the north takeoff structure to the new single pole tubular steel dead-end structure (833B) to be located within the CL&P ROW. (UI 1, Vol. I, pp. 18-19).

56. UI's 1730 transmission line will exit the substation from the southeast takeoff structure and span approximately 80 feet to UI's existing ROW via a new single pole tubular steel dead-end structure (NB 31A). (UI 1, Vol. I, p. 19).

57. Both the CL&P 1730 line and UI 1730 line will transition from a vertical configuration to a horizontal configuration as the lines approach the substation's north takeoff structures. The lines will then descend to the substation's bus work. The lines will be connected to and pass through the switchyard using rigid aluminum bus work and stranded jumper conductors. The total length of the re-routed transmission lines from the existing transmission line to the three new takeoff structures is approximately 240 feet. (UI 1, Vol. I, p. 19).

58. The proposed substation will be equipped with a "loop through" design configuration for existing overhead 115-kV transmission lines, transformer protection, and redundant automatic protective relaying equipment. The substation will use three circuit breakers to allow a "loop through" design in a ring bus configuration. This design will create three shorter transmission lines from the existing three terminal 1730 line at Trumbull Junction. The protective relaying and related equipment as well as a SCADA system for remote control and equipment monitoring will be located in the switchgear and control house. The proposed substation will be installed within a 14 foot high chain link fence. (UI 1, Vol. I, pp. 19-20).

59. The service life of the substation equipment is expected to be 40 years or more. (UI 1, Vol. I, p. 21).

60. The proposed project will require approximately 450 cubic yards of cut and 1,800 cubic yards of fill. (UI 4, response 11).

61. Vehicles can access the proposed site directly by existing street frontage on Wildflower Lane. No new access roads are required. (UI 1, Vol. I, p. 37).

62. The proposed substation's footprint will be approximately 335 feet by 200 feet. (UI 6, p. 2).

63. The anticipated in-service date is December 31, 2007. (UI 1, Vol. I, p. 83).

64. The closest occupied residence to the proposed site is approximately 220 feet west of the proposed site on Wildflower Lane. Residences to the south of the site, on Stella Street, are approximately 250 feet from the proposed site. Two occupied residences to the north of the existing CL&P transmission ROW are approximately 250 feet and 300 feet from the proposed site, and one occupied residence to the northeast is approximately 400 feet from the proposed site. (UI 1, Vol. I, p. 70; UI 4, response 2).

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

Materials & Equipment	$9,049,000
Permitting, Engineering, and Construction Management	$2,481,000
Construction	$5,770,000
Total	$17,300,000

(UI 1, Vol. I, p. 21)

Environmental Considerations

66. There are no known and recorded historic and archaeological sites on or near the proposed substation site. The Connecticut Commission on Culture and Tourism, (formerly the Connecticut Historical Commission) has indicated in a written response that "the proposed undertaking will have no effect on historic, architectural or archaeological resources listed on or eligible for the National Register of Historic Places." In the event prehistoric archaeological and/or historic resources are discovered during construction of the substation, UI will stop work in the immediate area and notify the State Historic Preservation Officer. (UI 1, Vol. I, p. 72; UI, Vol. I, Exh. B, Sec. 8; UI 4, response 18 and attachments).

67. There are no known existing populations of federal or state endangered or threatened species, or any state special concern species in the vicinity of the proposed site. The proposed site does not provide sufficient habitat to support any federal or state listed protected species. (UI 1, Vol. I, pp. 57, 68, 76; UI 1, Vol. I, Exh. B, pp. 4-6 – 4-7; UI 4, response 18 and attachments).

68. There are no wetlands or watercourses on the proposed site or adjacent to it. (UI 1, Vol. I, pp. 55, 56, 66-67, 76; Tr. 1, p. 10 (testimony of Charles Eves); Tr. 2, p. 10 (testimony of Charles Eves); UI 9, response 3).

69. UI will stockpile any excavated materials at the proposed site and contain them with straw bale barriers, fabric filter fences or other appropriate methods to prevent sedimentation caused by stormwater runoff. (UI 1, Vol. I, p. 66).

70. Soil disturbance associated with construction of the proposed substation would be confined to the proposed site. During construction, UI will take appropriate measures to ensure that excavated and fill materials are protected from erosion due to rain. UI will register for the DEP Discharge Permit for Stormwater Associated with Construction Activities. (UI 1, Vol. I, p. 69).

71. UI will remove approximately sixty trees with a diameter of six inches or greater to provide room for the proposed substation and access roads. (UI 4, Response 10).

72. UI will clear approximately 0.6 acres of trees and other vegetation from the proposed site. Overall, less than one acre of trees and other woody vegetation will be impacted by the substation. UI will clear a small wooded area on the northern and eastern sides of the proposed site to accommodate the substation and two areas of trees (approximately 12 feet by 130 feet each) to provide an access driveway for the proposed substation. UI may need to remove additional trees to accommodate equipment construction or line clearance. (UI 1, Vol. I, p. 67).

73. Groundwater is likely non-existent or located at a significant depth based on the shallow depth to bedrock. (UI 1, Vol. I, p. 55).

74. The proposed site is not located in or near any designated floodplain. The closest floodplain is approximately 1.25 miles west of the proposed site along the Pequonnock River where the elevation is approximately 75 feet above mean sea level. The proposed substation site is situated on an elevated escarpment at an elevation of approximately 165 feet. (UI 1, Vol. I, pp. 56, 67).

75. The nearest state-designated scenic road is the Merritt Parkway, which is located approximately 1,800 feet from the proposed substation property line. (UI 4, response 3).

76. There are no parks, designated recreational open spaces or open space areas, maintained by Trumbull or the state, which either abut or are located near the proposed site. Abraham Nichols Memorial Park, the closest recreation facility to the substation site, is approximately 0.8 miles north of the proposed site. The park is located north of the Merritt Parkway to the east of Shelton Road. (UI 1, Vol. I, p. 60).

77. Operation of the substation will cause no noise increase in the surrounding area except for a very slight increase during the quietest nighttime hours. The noise level is also expected to be imperceptible at nearly all hours at the property lines, except that it will be barely perceptible in a few nighttime hours at the property lines directly north, south, and west of the Site. The median hourly nighttime background sound is expected to increase by a maximum of 3 dBA. The maximum increase in the lowest hourly nighttime background sound is 7 dBA, and the median hourly daytime background sound is expected to increase by a maximum of 1 dBA. (UI 1, Vol. I, pp. 64-65, 74-75; UI 6, p. 11).

78. UI will install low-noise transformers at the substation. Other noise mitigation options, if necessary, include a noise barrier wall by the transformers and an architectural wall. UI will conduct post-construction sound level testing when the proposed substation is operating normally and will take necessary action if the levels are higher than projected or above the Trumbull noise regulations. (UI 1, Vol. I, pp. 65, 74; UI 6, p. 11; UI 9, response 9; Tr. 3, pp. 165, 198-199, 202, 228 (testimony of Brent Ferren, Richard Reed, Charles Eves).

79. During the proposed construction phase at the proposed site, nearby residences will experience some degree of noise similar to urban street or building construction activities. UI will minimize the noise impacts by limiting construction to normal working hours during the week, ensuring that all construction vehicles have properly functioning engine mufflers, and maintaining a buffer of trees and other vegetation to the west and south of the proposed site. (UI 1, Vol. I, p. 74).

80. Under rare conditions, the 115-kV circuit breakers will operate in response to system faults or transmission switching operations. The impulse noise level during breaker operation is 101 dBA. While these operations could occur at any time, UI expects the circuit breakers to operate less than five times per year, including maintenance operations. (UI 4, response 7).

81. Under normal conditions, the proposed substation will not be lit. Routine, outdoor work at the substation will generally be scheduled for daylight hours. While the substation will have sufficient lighting to ensure that emergency work can proceed during nighttime or in bad weather, the lighting will generally be turned off. If work is being performed at night, such as emergency switching, the substation will be lit while the work is performed. (UI 1, Vol. I, p. 20; UI 4, response 9).

82. UI will construct an oil containment basin around each proposed transformer, which is designed to contain 110% of the volume of transformer oil. A valve in the bottom of the basin will allow rainwater to discharge, but will close when oil is detected to contain any spill. The transformers will be filled with non-polychlorinated biphenyl mineral oil. The sumps will have adequate capacity to contain a spill in the event of an unintentional release of oil. (UI 1, Vol. I, p. 77; UI 4, response 8).

83. The substation control building will contain two banks of lead acid batteries. Each bank will be stored within a stationary rack that will be approximately 14 feet long, 3 feet wide and 4 feet high. Each rack will be placed within an acid resistant drip tray that will contain an acid neutralizing material to contain and neutralize any potential release from the batteries. UI will routinely inspect, test, and replace substation batteries. (UI 4, response 4).

84. UI will install erosion controls at the limits of the work area in accordance with the approval project plans, the D&M Plan and the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control. (UI 1, Vol. I, p. 76).

85. No blasting would be required during the proposed substation construction. UI will utilize rock augers and/or jack hammers when rock needs to be removed. (UI 4, response 5).

86. The tallest structures to be added as part of the proposed project will be two new transmission structures. The structure located within the proposed substation fenceline will be approximately 76 feet tall, and the other, located in the CL&P ROW, will be approximately 85 feet tall. (UI 6, p. 2; UI 4, response 14).

Visibility

87. A residence to the northeast of the proposed site and the residence on Wildflower Lane will have seasonally obstructed views of the proposed project. Approximately 400 feet of separation including at least 100 feet of dense, woody vegetation will block the proposed project from the viewshed of the residence to the northeast of the proposed site for much of the year. The Wildflower Lane residence will be separated from the proposed site by the existing road and the natural screen of mature plantings included in the proposed project. Two residences north of the CL&P ROW will have year-round unobstructed views of the substation and an unobstructed view of a new transmission structure.

88. Residences south of the Site and visitors to the Armenian Church of the Holy Ascension will have seasonally obstructed views of sections of the substation, through at least 120 feet of dense and mature deciduous trees. UI Exhibit 1 at 73; see also UI Exhibit 1 at 37-38, 58-59.

89. To mitigate these visual impacts, UI will: position the proposed substation infrastructure to be as far away as possible from the residences on Wildflower Lane and Stella Street; place mature plantings along the proposed substation's perimeter fence; situate the access driveways to prevent a direct view of the proposed substation from the residence on Wildflower Lane; and use low profile 115-kV bus structures. (UI 11, p. 13).

90. UI included in its application additional mitigative design configurations, including: an open air bus configuration with an architectural wall and mature plantings; a gas insulated substation (GIS) configuration with an architectural wall and mature plantings; and a GIS enclosed in a "barn" or similar outbuilding with mature plantings and a 14 foot chain link fence surrounding the proposed substation. (UI 6, p. 13).

91. UI does not expect the proposed project to be visible to motorists on Huntington Turnpike and the Merritt Parkway. Motorists on Nichols Avenue and the travel lanes and entry/exit ramps of State Route 8 will have seasonally obstructed views of the proposed substation, similar to the existing view of the transmission lines and switch structure adjacent to the proposed site. (UI 1, Vol. I, pp. 73-74).

Electric and Magnetic Field Levels

92. The proposed substation would cause the following changes in the magnetic field levels:

a) The maximum magnetic field along the entire fence line (points C-1 to C-8) is expected to be, after the Middletown/Norwalk project (expected approximately 2010), 41.8 mG for a normal load and 50.1 for a peak load. In comparison, the

existing condition prior to Bethel/Norwalk project was 76.3 mG, and, post-Bethel/Norwalk but prior to Middletown/Norwalk project (the actual current condition), the magnetic field was calculated to be 51.0 mG for a normal load and 89.6 for a peak load.

b) The magnetic field along the driveway (point D-1) is expected to be, after the Middletown/Norwalk project, 1.0 mG for a normal load and 1.7 for a peak load. In comparison, the existing condition prior to Bethel/Norwalk project was 1.1 mG, and, post-Bethel/Norwalk but prior to Middletown/Norwalk project, the magnetic field was calculated to be 1.4 mG for a normal load and 2.5 for a peak load.

c) The magnetic field at the edge of the CL&P easement (point D-2) is expected to be, after the Middletown/Norwalk project, 15.3 mG for a normal load and 25.1 for a peak load. In comparison, the existing condition prior to Bethel/Norwalk project was 24.4 mG, and, post-Bethel/Norwalk but prior to Middletown/Norwalk project, the magnetic field was calculated to be 23.7 mG for a normal load and 40.9 for a peak load.

d) The magnetic field at the edge of the CL&P easement (point D-3) is expected to be, after the Middletown/Norwalk project, 11.8 mG for a normal load and 19.5 for a peak load. In comparison, the existing condition prior to Bethel/Norwalk project was 21.0 mG, and, post-Bethel/Norwalk but prior to Middletown/Norwalk project, the magnetic field was calculated to be 18.2 mG for a normal load and 32.1 for a peak load.

e) The magnetic field at the edge of the CL&P easement (point D-4) is expected to be, after the Middletown/Norwalk project, 3.8 mG for a normal load and 10.6 for a peak load. In comparison, the existing condition prior to Bethel/Norwalk project was 3.9 mG, and, post-Bethel/Norwalk but prior to Middletown/Norwalk project, the magnetic field was calculated to be 7.5 mG for a normal load and 19.6 for a peak load.

f) The magnetic field at the northernmost property line of 39 Stella Street (point D-5) is expected to be, after the Middletown/Norwalk project, 0.6 mG for a normal load and 0.3 for a peak load. In comparison, the existing condition prior to Bethel/Norwalk project was 0.2 mG, and, post-Bethel/Norwalk but prior to Middletown/Norwalk project, the magnetic field was calculated to be 0.3 mG for a normal load and 0.2 for a peak load.

g) The magnetic field at the northernmost property line of 45 Stella Street (point D-6) is expected to be, after the Middletown/Norwalk project, 0.8 mG for a normal load and 0.5 for a peak load. In comparison, the existing condition prior to Bethel/Norwalk project was 0.3 mG, and, post-Bethel/Norwalk but prior to Middletown/Norwalk project, the magnetic field was calculated to be 1.2 mG for a normal load and 0.9 for a peak load.

h) The magnetic field at the northernmost property line of 52 Stella Street (point D-7) is expected to be, after the Middletown/Norwalk project, 1.3 mG for a normal load and 1.0 for a peak load. In comparison, the existing condition prior to Bethel/Norwalk project was 0.4 mG, and, post-Bethel/Norwalk but prior to

Middletown/Norwalk project, the magnetic field was calculated to be 1.2 mG for a normal load and 0.9 for a peak load.

(UI 1, Vol. II, Exh. F, p. 32; UI 6, p. 10; UI 9, response 10).

93. The primary sources of EMFs at the Site are the existing transmission lines, and the contribution to EMF levels due to the proposed substation is expected to be insignificant. (UI 1, Vol. I, p. 80; UI 1, Vol. II, p. 36; UI 4, response 17; Tr. 3, pp. 82-83, 115, 140 (testimony of Kathleen Shanley, Michael Silva, Richard Reed).

94. The projected EMF levels at the proposed site after the proposed project's completion are in the range of background EMF variation for areas far-removed from any electric utility infrastructure. Background levels are typically less than 10 mG, with higher levels near particular sources. (Tr. 3, pp. 18-19, 21-22 (testimony of Dr. William Bailey); *id.,* pp. 25-28 (testimony of Kathleen Shanley)).

95. The substation-generated EMF levels will not impact the nearby residences and have not been found to have "any demonstrable effect on health." On a public health spectrum, EMF are "at the end of the spectrum that of either no or very low risk." (Tr. 3, pp. 16, 19, 61-63) (testimony of Dr. William Bailey)).

96. The magnetic field resulting from the existing transmission lines and proposed substation would be less at the residence at 6 Wildflower Lane than at the driveway (point D-1), since the residence is located approximately 120 feet farther away from the source on the other side of Wildflower Lane. The nearest abutting property to the proposed substation on Stella Street is approximately 225 feet from the substation fenceline (points C-1 to C-8). Since the magnetic field decreases with distance from the source, the magnetic field at this Stella Street location would be less than that on Wildflower Lane. (UI 4, response 17).

97. The EMF levels due to the proposed project will be further reduced (by 50% or more at the CL&P ROW edges) when CL&P implements an optimal phasing project for the 115-kV lines passing by the Site. CL&P will likely do so when UI connects the new substation to the existing CL&P transmission lines. (Tr. 4, pp. 189-190, 211-212 (testimony of Robert Carberry).

98. The proposed substation's design is consistent with the Siting Council's Best Management Practices for Electric and Magnetic Fields. (UI 1, Vol. I, p. 79).

Safety and Reliability

99. A secure 14 foot chain-link fence will enclose the substation yard to prevent unauthorized access to the proposed site. At the top of the fence is one foot of barbed wire that is slanted at a 45 degree angle into the proposed substation. The substation yard will also be gated, locked, and monitored with motion detection and security cameras. Dispatchers at UI's system operations center in Shelton, which is never closed, will be notified if the security system alarms ring and will notify the proper authorities. Appropriate signage will be posted at the substation informing the public of the high voltage facilities within the substation. If equipment experiences a failure, protective relaying will remove the equipment from service. (UI 1, Vol. I, p. 20, 79; UI 4, response 16; UI 6, p. 12).

100. The proposed project will utilize "loop through" design configuration for existing overhead 115-kV transmission lines and transformer protection. In the event of a fault, circuit breakers will open to isolate the fault. Redundant automatic protective relaying equipment will automatically detect irregular system conditions and send a protective trip signal to the circuit breakers at each end of a line to segregate the faulted section of the transmission line. (UI 1, Vol. I, pp. 19-20).

101. The protective relaying and related equipment as well as a SCADA system for remote control and equipment monitoring will be located in the switchgear and control house. UI will install smoke detectors in the switchgear and control house and monitor them from a remote location. UI will equip the control house with fire extinguishers. (UI 1, Vol. 1, p. 20).

102. The proposed substation will have sufficient lighting to ensure that emergency work can proceed during nighttime or in bad weather. Additionally, the proposed substation will be equipped with security cameras and motion detectors so UI can monitor unauthorized access to the substation. (UI 1, Vol. I, pp. 20-21).

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