DOCKET NO. 272 - The Connecticut Light and Power Company and The United Illuminating Company Application for a Certificate of Environmental Compatibility and Public Need for the Construction of a New 345-kV Electric Transmission Line and Associated Facilities Between Scovill Rock Switching Station in Middletown and Norwalk Substation in Norwalk, Connecticut Including the Reconstruction of Portions of Existing 115-kV and 345-kV Electric Transmission Lines, the Construction of the Beseck Switching Station in Wallingford, East Devon Substation in Milford, and Singer Substation in Bridgeport, Modifications at Scovill Rock Switching Station and Norwalk Substation and the Reconfiguration of Certain Interconnections	}	Connecticut Siting Council April 7, 2005

Opinion

I. Introduction

On October 9, 2003, the Connecticut Light and Power Company (CL&P) and The United Illuminating Company(UI) [collectively referred to as the "Applicants" hereafter] applied to the Connecticut Siting Council (Council) for the construction of a new 345-kV electric transmission line and associated facilities between Scovill Rock Switching Station in Middletown and Norwalk Substation in Norwalk, Connecticut including the reconstruction of portions of existing 115-kV and 345-kV electric transmission lines, the construction of the Beseck Switching Station in Wallingford, East Devon Substation in Milford, and Singer Substation in Bridgeport, including modifications at Scovill Rock Switching Station and Norwalk Substation and the reconfiguration of certain other minor interconnections.

At the time the application was filed, Connecticut General Status (CGS) Section 16-50p required that the Council, in deciding this application, must consider and balance the proposed 345-kV transmission line and reconstruction of a 115-kV line as a public benefit, which is defined as necessary for the reliability of the electric power supply of the state or for a competitive market for electricity versus the probable environmental impacts created by construction and operation of these facilities. Also, the Council shall consider feasible and prudent alternatives by any party or intevenor that would address the same public need. Specifically, the Council should determine what part if any of the proposed facility should be located overhead; that the facility conforms to the long range plan for expansion of the electric power grid of the electric systems serving the state and interconnected utility systems and would serve the interests of the electric system economy and reliability; and that the overhead portions of the facility are cost effective and the most appropriate alternative including underground alternatives based on a life-cycle cost analyses. Moreover, the Council shall determine the location of the proposed line would not pose an undue hazard to persons or property to areas traversed by a transmission facility. The Council may not grant a Certificate if it finds insufficient need for the facilities, unmitigated effects to the environment, undue health effects, and/or is in conflict with state policies.

II. Effect of Public Act 04-246

In the last legislative session the General Assembly enacted Public Act (P.A.) 04-246- *An Act Concerning Electric Transmission Line Siting Criteria* effective June 3, 2004. This Act is

applicable to Certificate applications originally filed on or after October 1, 2003, and for which the Council has not rendered a decision prior to June 3, 2004. Hence, the Act is applicable to this application. This law defined additional decision criteria for a transmission line, in addition to those already outlined in the previous paragraph, as follows:

- "...including a specification of every significant adverse effect, including, but not limited to, *electromagnetic fields*" (emphasis added)

- "Any application for an electric transmission line with a capacity of three hundred forty-five kilovolts or more that is filed on or after May 1, 2003, and that proposes the underground burial of such line in all residential areas and overhead installation of such line in industrial and open space areas affected by such proposal shall have a rebuttable presumption of meeting a public benefit for such facility if the facility is substantially underground, and meeting a public need for such facility if the facility is substantially above ground. Such presumption may be overcome by evidence submitted by a party or intervenor to the satisfaction of the council."

- "...there shall be a presumption that a proposal to place the overhead portions, if any, of such facility adjacent to residential areas, private or public schools, licensed child day care facilities, licensed youth camps or public playgrounds is inconsistent with the purposes of this chapter. An applicant may rebut this presumption by demonstrating to the council that it will be technologically infeasible to bury the facility".

- "...regulations or standards as the council may adopt pursuant to section 16-50t, including, but limited to, the council's best management practices for electric and magnet fields for electric transmission lines..."

- "...an area that provides a buffer zone that protects the public health and safety, as determined by the council."

- "... the council shall administratively notice completed and ongoing scientific and medical research on electromagnetic fields."

- "The council shall adopt, and revise as the council deems necessary, standards for best management practices for electric and magnetic fields for electric transmission lines."

The Council has consistently considered issues of electric and magnetic fields (EMF) in deciding electric transmission projects 69 kilovolts and greater, as part of its obligation to consider public health and safety. Furthermore, this agency is cognizant of proposed electric transmission system upgrades and thus continually reviews its application guidelines to best serve applicants and protect the interests of the state and its citizens. In considering energy projects, the Council has, in this docket, taken evidence and administrative notice of completed and ongoing scientific and medical research on electromagnetic fields, as well as applying the Council's Best Management

Practices for Electric and Magnetic Fields. Furthermore, the life-cycle cost analysis is a requirement for any transmission facility application.

The Council is uncertain of all of the criteria the legislature used in its determination to have transmission lines, 345-kV or greater, buried adjacent to "statutory facilities" (residential areas, private or public schools, licensed child day care facilities, licensed youth camps or public playgrounds); however, we understand the legislative intent is to protect the public health and safety of children. The statute is clear that for instances where installing underground cable is not technically feasible and overhead transmission lines are permitted, the Council must establish a buffer zone, but for underground cables there is no statutory directive to establish a buffer zone. Because we believe the children of Connecticut should be protected whether next to overhead transmission lines or underground cables, we will require comparable mitigating methods.

III. Need

Since 1972, pursuant to CGS Section 16-50r (a), the Council has had the legislative charge to annually review the state's utility forecasts of loads and resources. These annual reviews help the state monitor trends in the demand for electricity and the resources to meet that need.

During the early 1970s southwest Connecticut began to import power from sources outside the area. At that time, southwest Connecticut was the only major load area in the state not already served by a 345-kV system. In recognizing this need, CL&P applied for, and the Council granted, a Certificate for a 345-kV line originating at Long Mountain Switching Station, New Milford, Connecticut and terminating at Plumtree Substation, Bethel, Connecticut (Docket 5). This was the first segment of a planned 345-kV transmission line "loop" into southwest Connecticut via Norwalk Substation, Norwalk and continued back to Beseck Switching Station, Wallingford. At that time CL&P and UI further studied the need to expand the 345-kV electric transmission grid into southwest Connecticut and determined a 345-kV transmission line into southwest Connecticut was not needed until the 21st century due to a lower load growth in the demand for electric energy. Subsequently, the Applicants began reinforcing the existing 115-kV transmission system serving southwest Connecticut during the late 1980s, including the construction of a new 115-kV transmission line in the early 1990s.

The State of Connecticut and ISO-NE have recognized that southwest Connecticut is an inefficient and vulnerable portion of transmission infrastructure that is isolated from the 345-kV transmission system and much of the available lower cost power generated from within the state and the surrounding region. Presently, older, less efficient and more polluting generation resources in the southwest Connecticut area must run under many system operating conditions, while other newer, more efficient, and lower cost generators inside and outside of southwest Connecticut have their operations restricted because of high short circuit duty and limitations on the existing 115-kV transmission system. The "inefficiency cost" of the existing transmission system in Connecticut is now approximately $308 million per year, including the costs of "reliability must run" contracts, gap generation and/or demand response initiatives, congestion costs, and the costs of running uneconomic generators. These costs will continue to rise until the transmission infrastructure is better able to service the electric needs of southwest Connecticut.

No one in this proceeding challenged or disputed the need for the proposed project and the Council concludes there is need for a 345-kV transmission line for southwest Connecticut.

IV. Reliability

The existing 115-kV transmission grid serving southwest Connecticut fails to meet North America Electric Reliability Council, Northeast Power Coordinating Council, and New England Power Pool reliability standards. The Federal Energy Regulatory Commission (FERC), ISO-New England (ISO-NE), and Connecticut Department of Public Utility Control (DPUC) concur that the southwest Connecticut electric transmission system is not reliable even with the Bethel to Norwalk 345-kV line (Phase I) in service. Failing to conform to reliability standards exposes southwest Connecticut to system failure and potentially jeopardizes adjacent electrical interfaces with New York and New England by increasing the risk of blackouts and load shedding leading to a potential collapse of the transmission grid. These ramifications would be both costly and harmful to the region's economy, as well as being disruptive and potentially harmful to citizens of this state.

For reliability purposes, the integrated transmission grid is constructed in a series of loops, if interruption occurs on one of the lines to an area served by a loop, service can still be provided to the area from the other end of the loop. Accordingly, the existing 345-kV system includes several interconnected loops within Connecticut, and portions of loops that extend beyond Connecticut into Rhode Island, Massachusetts, and New York. Most of the load centers and generation in the eastern and central parts of Connecticut are connected to loops on the 345-kV transmission grid; however, southwest Connecticut lacks any such 345-kV loop.

V. Independent System Operator - New England

The Independent System Operator – New England (ISO-NE) is responsible for managing the New England region's bulk electric power system, operating the wholesale electricity market, administering the region's open access transmission tariff, and conducting centralized electrical power planning. ISO-NE is charged with providing a coordinated transmission plan that identifies upgrades for reliability and economic needs.

This Council has been created by the General Assembly of Connecticut and does not answer to the ISO-NE. Nonetheless, CGS Section 16-50p(a)(3)(D), as amended by Public Act 04-246, requires that "the facility conforms to a long-range plan for expansion of the electric power grid of the electric systems serving the state and interconnected utility systems . . ." Because Connecticut depends upon electric power produced from outside our state, we cannot consider Connecticut in isolation. While not allowing ISO-NE to dictate a result, this Council must ensure that the facility we approve will meet reliability standards to allow interconnectability to both the intrastate and interstate electric system grid. We conclude that the approved facility meets these standards.

VI. Applicant's Proposed Project

The proposed project is for a new 345-kV transmission line and the rebuilding of existing 115-kV lines including one new switching station (Beseck in Wallingford) and two new substations (East Devon, in Milford and Singer in Bridgeport) and modifications to the existing Scovill Rock Switching Station, Middletown Substation and Norwalk Substation, Norwalk.

The Applicants' preferred route totals 69 miles with Segment 1 and Segment 2 consisting of approximately 45 miles of overhead transmission line within existing rights-of-ways (ROW),

except for the 2.5-mile segment of new 345-kV transmission line between the Scovill Rock Switching Station and Chestnut Junction, where 85 additional feet of ROW width (approximately 9.5 acres) would have to be acquired. The other portion of the preferred route is Segment 3 and Segment 4, consisting of approximately 24 miles of underground transmission cable, which would be installed primarily within public roads. In all instances, it was originally proposed to have two 345-kV high pressure fluid-filled (HPFF) cables installed per circuit to better match the capacity of the 345-kV overhead circuit.

For the overhead portion, new structures would be located near existing structures plus or minus 100 feet, maintaining construction footprints and visual perspective from various view sheds in a community. The Applicants initially proposed a line design with structures ranging between 80 feet to 130 feet in height that could support higher line tensions with lower tower heights and minimized visibility, reduced conductor sag, and reduced blow-outs of conductor. This helps minimize ROW clearing, and allows shield wires to be brought closer to the conductors.

While this line design appeared promising, other structure designs may need to be used to mitigate EMFs. These structures would be more like telecommunication monopoles, at heights of 135 feet with six support arms. Low EMF-design structures would support conductors in a vertical position, three conductors on each side of the pole with reverse phases (115-kV on one side and 345-kV on the other) or split phase with the three phases of one circuit split into six conductor positions (arranged A-B-C vs. C-B-A phasing). This technique has been used for balancing impedance, but now is being considered for EMF mitigation. In a delta configuration, the conductors are positioned in a triangle to increase field cancellations. These structures are typically between 85 and 105 feet in height and have the effect of lowering EMF fields and limiting visibility. Generally, an increase in structure heights effectively mitigates EMF levels by increasing distance to persons.

The Applicants identified and supported route deviations located in the Town of Cheshire, City of Bridgeport, Town of Westport and City of Norwalk.

The Cheshire supported change is to place an existing 115-kV circuit underground using XLPE cable along Old Farms Road and Old Lane Road. The proposed new 345-kV transmission line and the remaining 115-kV line would be installed on a single double-circuit monopole structure.

The Bridgeport supported change crosses the Pequonnock River, avoiding impacts to downtown Bridgeport.

The Westport supported change crosses the Saugatuck River, bypassing downtown Westport and its historic district.

The Norwalk supported change crosses the Norwalk River, avoiding impacts to the Riverside Cemetery.

The Council concurs with the benefits afforded each municipality and shall order the supported route deviations above be incorporated into the D&M Plan.

VII. Alternatives Proposed by Applicant

Alternative A would consist of 60 miles of overhead transmission lines and 13 miles of underground cable. Alternative A would deviate from the proposed route beginning at the

proposed Singer Substation along an underground route through Bridgeport and Fairfield to a new Hawthorne Transition Station then overhead in Fairfield continuing to Norwalk Junction through to the Norwalk Substation. This route would require acquisition of about 65 acres, and no homes would need to be acquired.

Alternative B would consist of 71 miles overhead transmission lines and four miles of underground cable. This route deviates from the proposed route beginning at the proposed East Devon Substation where the 345-kV line would be constructed overhead to Trumbull Junction then to a proposed Seaview Transition Station in Bridgeport. The proposed Seaview Transition Station would have a 345-kV underground transmission cable to and from the Singer 345-kV Substation and continue overhead to Trumbull Junction then to Norwalk Junction and terminate at the Norwalk Substation. This route would require acquisition of approximately 115 acres and 29 homes.

The General Assembly's mandate to maximize undergrounding 345-kV cable gives this Council no alternative but to reject Alternatives A and B.

VIII. Council's Approved Route

The Council approves a route with modifications as follows:

Overhead facilities will be built from:

Scovill Rock Substation to Chestnut Junction;

Oxbow Junction to the proposed Beseck Switching Station including the Royal Oak Bypass along the Middletown and Durham town line for the proposed 345-kV transmission line and leave the existing 115-kV ROW in place;

Black Pond Junction to proposed Beseck Switching Station;

Proposed Beseck Switching Station to Cook Hill Junction placing one existing 115-kV circuit underground, and the other existing 115-kV circuit, together with the new 345-kV circuit will be installed on a steel composite monopole in the vicinity of Old Farms Road and Old Lane Road;

Cook Hill Junction to the proposed East Devon Substation, the right-of-way shall be shifted farther away from buildings on property owned by Congregation B'Nai Jacob/Ezra Academy and the center of the ROW shall be maintained in vicinity of the Jewish Community Center; and

Devon Generating Station to the proposed East Devon Substation.

Underground facilities using XLPE cable will be built from:

The proposed East Devon Substation to the proposed Singer Substation (a site agreed upon by PSEG and the Applicants) including the Bridgeport supported change; and

The proposed Singer Substation to the existing Norwalk Substation including the Westport and Norwalk supported changes.

IX. Maximizing Undergrounding

During the evidentiary hearings ISO-NE emphatically stated that the application of 24 miles of underground high-pressure fluid filled (HPFF) cable would add too much capacitance to an already weakened electric system, potentially causing outages and damage to transmission equipment. Based on Public Act 04-246 and ISO-NE's position not to support an underground proposal using HPFF cable of that length, the Council directed the Applicants and ISO-NE to jointly work on a solution that would maximize the amount of 345-kV cable. As a result, the ad hoc Reliability and Operability Committee (ROC) was formed.

The Applicants estimated that four months would be needed to accomplish its task; however, it took more than six months to complete. This effort required use of transient network analyses (TNA) which test the limit of operating tolerance of critical electric system elements (i.e. surge arresters, transformers circuit breakers) for abnormal voltages before the equipment trips out of service or fails. Because TNA models require a complex and lengthy process, the ROC exercised engineering judgment in developing various operating scenarios, assumptions and types of mitigation. The Applicants and its consultants conducted contingency scenarios ranging from four miles to 44 miles of undergrounding. These TNA studies documented that temporary overvoltages (TOV) grew intolerably as the underground cable was extended beyond the proposed 24 miles. These TOVs indicate the limit of what a system element can tolerate and clearly define the amount of underground cable that could be installed without jeopardizing the reliability of the electric grid.

Mid-way through the proceeding, KEMA, the Council's consultant, suggested an additional 10 to 20 miles beyond the proposed 24 mile underground segment could be possible based on the implementation of C-type filters. KEMA based this conclusion on a harmonic impedance study, but qualified it by stating that transient network analyses would still have to be performed.
To further resolve the question of how much 345-kV transmission cable could be reliably placed underground, the Council staff moderated a technical meeting between the Applicants, its consultants, ISO-NE, KEMA, and other transmission technology experts. The consensus among the participants was that no more than 24 miles (48 circuit miles) of 345-kV underground cable could be installed underground. For the 24 miles of 345-kV underground cable to operate reliably within the electric system will require the following mitigating actions:

- XLPE cable must be used to reduce capacitance in place of HPFF cable as originally proposed;
- Up to 1,200 surge arresters and upgrades of other equipment would be required at about half of CL&P's transmission substations and all of UI's transmission substations, for current protection margins to survive TOV;
- 500-kV rated equipment must be installed in the new 345-kV substations; and
- More extensive changes must be made to remedy local area problems, such as those that exist at Rocky River Substation.

However, in light of the evidence contained in the transient network analyses and related harmonic studies performed by the ROC Group's consultants, KEMA ultimately concluded that it would not be prudent or feasible to attempt to mitigate the TOVs with C-type filters. C-Type

filters are not known to have been used for the purpose of mitigating TOVs. Thus, implementing C-type filters in a project of this scale and importance, coupled with the critical consequences of failure, would not be prudent.

The Council also examined and rejected the proposal to divide the 24 miles of underground cable into segments because the added circuit east of East Devon Substation reduces the linear distance of the underground cable and causes problems with the grounding of the transmission cable. An underground cable could be installed in a mid-section of an overhead line (a.k.a porpoising); however, to maintain integrity of the hybrid transmission line, transition stations would be required at each end of the underground segment in addition to the substations at both ends of the overhead line. This configuration would be at an added risk of lightning strikes, transformer switching, and produce increased costs. In light of the evidence to subdivide the 24 miles of underground cable the Council will order the 24 mile route with supported changes and modifications be built in segments three and four.

Pursuant to P.A. 04-246, the Council must determine the maximum underground transmission configuration that could reliably operate. Based on the ROC Report and KEMA's final conclusions, the Council concludes that the proposed 24 mile underground route would reliably operate within the electric system grid. Any additional underground installation beyond this length increases temporary overvoltage beyond a safety margin, which could compromise substation equipment. Although the Council recognizes the added risk of maximizing underground transmission cables, the Council nonetheless finds the proposed preferred route of 24 miles of underground high-voltage transmission cable between Norwalk Substation and the proposed East Devon Substation meets the criteria of P.A. 04-246.

X. Rejected Alternate Solutions

The Council needs to carefully weigh the advantages and disadvantages of each proposal and pursue cost-effective strategies that resolve problems without overbuilding or under building infrastructure. In addition to the Applicant's proposed project, other proposed solutions for southwest Connecticut's future electric demands include: 1) "No build" (or lack of action), 2) new generation, 3) distributed generation, 4) conservation and load management, 5) use of existing rights-of-way, 6) marine routes, 7) High Voltage Direct Current technology, 8) Gas Insulated Transmission technology, 9) 115-kV transmission alternatives and 10) other 345-kV transmission routes.

a. No Build Alternative. This Council fully understands the reliability issues facing southwest Connecticut (if not the entire state and region) and therefore believes that a "no build" alternative to correct these inadequacies would be irresponsible and likely result in adverse economic effects and impacts to public health and safety. There is every expectation that the present situation will steadily worsen with costs rising and reliability deteriorating.

b. New Generation. New generation resources require a transmission system capable of safely and efficiently transporting such sources to the load centers. Since the deregulation of electric generation in 1998, five generating stations in the southwest Connecticut interface (Bridgeport, Milford, Oxford, Meriden and Wallingford) have received Certificates from the Council. Two of the five projects have not come to fruition because of litigation, inadequate financing, and a weak energy market. However, the remaining units are not able to generate at their maximum output because the existing 115-kV system cannot accommodate both new

and existing generation on peak demand days. Clearly, this condition would only be more acute if all projects were to materialize.

Under the new proposed 345-kV network, the system impedance between generators and fault locations is increased, thereby reducing short circuit currents on the 115-kV system. Dual voltage networks enable the larger generators to be connected to the higher voltage network, with autotransformers providing additional impedance between generators and faults on either voltage system. Thus a 345-kV grid would have both the capacity and characteristics to efficiently allow existing and future generation facilities to provide full output of energy to the electric grid and would thereby substantially reduce, if not eliminate, the so called "congestion charges." At this time, new generation is not timely to resolve reliability but it must be considered to be a part of a long-term solution in southwest Connecticut to strengthen the overall electric system.

c. Distributed generation. Distributed generation uses small multi-kilowatt generators at end-use customer locations and could help to support southwest Connecticut during peak demand days. Nevertheless, it would take hundreds if not thousands of them to offset the growing demand for electricity, regardless of other barriers like the coordination with grid operations, fuel availability, and technological maturation.

d. Conservation and load management. Conservation and load management (C&LM) is a long-standing tool to curb demand for electricity and provide other useful benefits. The Council appreciates its value and urges the continued development of innovative technologies to reduce unnecessary electric consumption. Indeed, C&LM programs resulted in about 450 MW in peak-demand savings statewide over the past decade (approximately equal to the output of a large electric generating facility), and saved southwest Connecticut 70 MW in 2003-2004. However, these programs are customer-driven and actions are at the customer's discretion, with demand reduction savings as only potential savings. The Council does not see this as a long-term solution in an area where electric demand growth outpaces that of the rest of the state, or even New England.

e. 115-kV Transmission Solutions. The Applicants considered rebuilding the existing 115-kV transmission grid in southwest Connecticut. A rebuild would require modifications to 111 miles of existing rights-of-way, the creation of 37 miles of new rights-of-way, construction over 150 miles of underground 115-kV lines and building many new substations. To accomplish this, some existing 115-kV lines serving southwest Connecticut would need to be taken out of service, further compounding reliability issues. This also fails to expand a 345-kV loop into southwest Connecticut and simply aggravates the short-circuit duty problem in an area which consumes nearly one third of the state's electrical demand. Thus the Council concludes this alternative provides no reasonable solution for Connecticut's future energy demands compared to the proposed Middletown-Norwalk transmission project.

f. Terrestrial Routes. Many other different scenarios using existing rights-of-way or corridors were examined. Alternative routes using highways, railroads, and gas pipelines revealed many conflicts that would make them incompatible with the addition of a 345-kV transmission line.

i. Highways. Interstate Routes 91 and 95 were examined and rejected on the basis of space availability within existing rights-of-way, potential acquisition of property, access

and constructability, severe constraints within urban areas, and sensitive environmental considerations.

ii. Route 15 Route. Route 15 was considered and rejected on the basis of historic designation of the Merritt Parkway, space availability within existing rights-of-way, potential acquisition of property; access and constructability, severe constraints within urban areas, and sensitive environmental considerations.

iii. Railroads. Railroads were considered and rejected because most of these railroad corridors do not provide a direct route from Middletown to Norwalk nor sufficient space for transmission line construction. The CL&P agreements that were reached for the Pequonnock-Ely Avenue line do not allow any transmission lines on the railroad greater than 115-kV. A separate UI agreement in effect until the year 2030 limits voltage on the existing railroad catenaries at 115-kV. Other conflicts include the potential acquisition of property, access and constructability, severe constraints within urban areas, and sensitive environmental considerations.

g. Marine Routes. Two marine routes were considered; one between Singer Substation and Norwalk Substation and the other was between East Shore Substation and East Devon Substation. Due to installation and operational constraints in a marine environment, the technology of choice is self-contained fluid-filled cable that would consist of six cables buried 10 to 15 feet deep in a corridor between 90 and 200 feet in width. Besides complying with many environmental state and federal regulations, these projects are not a "water-dependent use" and would be in conflict with state law prohibiting development of energy projects within Long Island Sound. It would also have even more undesirable electrical characteristics which constrain options on land. Thus these alternatives are not a viable option.

h. Other 345-kV routes.

i. The "Northerly Route" crosses the Towns of Middletown and Middlefield within an existing electric transmission ROW that now has three 345-kV circuits. The addition of a fourth 345-kV line would require acquisition of property and create an unacceptable risk for a contingency event that would violate reliability criteria. Based on reliability alone, the applicant rejected this route.

ii. The "East Shore Route" from East Wallingford to East Shore Substation, New Haven would use an existing 345-kV line. It could be possible to upgrade to larger conductors but this would require a complete rebuild of the line. Also, this single 345-kV circuit scenario would jeopardize reliability. A new 345-kV line could be installed in parallel to relieve reliability concerns but would require expansion of the ROW, crossing of New Haven Harbor then through New Haven streets to connect to East Devon Substation. This route does not offer any superior attributes over the proposed Middletown-Norwalk project.

i. DC Transmission Technology. High Voltage Direct Current (HVDC) is an alternative transmission technology to the standard alternating current technology used in the United States and throughout the world. HVDC is typically used to move energy from one region to another where synchronous operation is problematic, where an integrated electric network does not exist or from a generator to a load center. Voltage source converter HVDC is able to mitigate instantaneous pickup and injection of undesired harmonic resonances, the primary issues that determine the amount of transmission cable that can be installed underground. Installations of this size have not been constructed, and they cannot automatically adjust

power flow in a contingency event, which adversely affects system reliability. The Council will therefore dismiss HVDC technology

j. Gas Insulated Transmission technology. Although this technology has existed for 30 years or more, utilities have not adopted this technology for common use in any long distance transmission lines. The use of Gas Insulated Transmission technology on a project of this importance would not be prudent.

XI. Conclusions on Technologies

Ultimately, the Council must review technologies on their own merit and determine which technology is technically feasible. Because CGS Section 16-50p(i), as amended by P.A. 04-246, requires that portions of the line adjacent to certain listed facilities be buried unless "it will be technologically infeasible to bury" the line, a key question is what is meant by the term "technologically infeasible"? The Council believes that this question must be answered in the context of each facility application before it. The reliability of Connecticut's electric system is at stake, and we interpret the term "technologically infeasible" as excluding unreliable alternatives. The Findings of Fact confirm the importance of this proposed facility to the reliability of Connecticut's electric system. The Council therefore concludes that technology that has not been proven reliable cannot be considered feasible. Another test of reliability must be the consideration of whether a proposed technology has been proven, is in use elsewhere, and that servicing and replacement parts are available. If Connecticut uses a system where only one manufacturer builds such a system which is in use nowhere else, reliability is again greatly put at risk and such a system cannot be approved.

It is this Council's obligation to weigh the operability and reliability of this proposal. The extensive discovery in all types of transmission technologies raised both advantages and disadvantages. Technologies that are theories or have not been implemented on a large scale would not be choices the Council would consider trustworthy. There are proven technologies that could be selected but for P.A. 04-246's preference for the maximum amount of 345-kV transmission cable being installed underground adjacent to the statutory facilities. Since HPFF has high capacitance compared to cross-linked polyethylene (XLPE), then HPFF compromises maximizing of underground transmission lines. XLPE, the technology of choice at voltages less than 345-kV, is being used world-wide and is regarded as a satisfactory risk in reliability. Each choice involves risk and the Council believes the risk of installing XLPE at 345-kV will be reasonable, especially with two cables for redundancy.

XII. Best Management Practices

Section 10 of the Public Act 04-246, codified in Conn. Gen. Stat. § 16-50t(c), states, in part, that, "The Council shall adopt, and revise *as the council deems necessary*, standards for best management practices for electric and magnetic fields for electric transmission lines. Such standards shall be based on the latest completed and ongoing scientific and medical research on electromagnetic fields and shall require individual, project-specific assessments of electromagnetic fields, taking into consideration design techniques including, but not limited to, compact spacing, optimum phasing of conductors, and applicable and appropriate new field management technologies. *Such standards shall not be regulations for purposes of chapter 54.*" (Emphasis added.) The Council notes that Conn. Gen. Stat. § 16-50t (c) did not create the best management practices; they pre-existed the statute.

The Council adopted Electric and Magnetic Field Best Management Practices (EMF BMP) on February 11, 1993 on its own initiative. The Council believes that this version of the EMF BMP is sufficient for deciding this docket. All parties and intervenors had the full opportunity to present any witnesses regarding EMF issues, any documentary evidence, including, but not limited to, published medical and scientific studies, the full opportunity to present any EMF measurements, and the full opportunity to advocate that the Council apply any particular standard desired by that party. During our extensive hearings, the Council had, in addition to the 1993 EMF BMP, "the latest completed and ongoing scientific and medical research on electromagnetic fields" and had extensive evidence on all technologies considered for EMF mitigation and undergrounding. The Council has thus complied with Conn. Gen. Stat. § 16-50t in this regard.

Although scientific knowledge does not at this time permit firm judgments about possible health effects of 60 hertz electric and electromagnetic field (EMF) exposures from transmission facilities, the Connecticut Siting Council has adopted a cautious approach to the issue by adopting BMPs. These practices are intended to recognize the latest information as well as effective technologies and management techniques on a project-specific basis to protect public health and safety and maximize the efficiency of the transmission industry. The Council finds that the new lines will be contained within a buffer zone adequate to protect public health and safety, and will not pose an undue hazard to persons and property along the location traversed by the line.

XIII. EMF Considerations

In this proceeding electric and electromagnetic fields (EMF) became an important issue as expressed through participants in the hearing process and statements received from the public. The Council appreciates the in-depth testimony on EMF. The scope and breadth of EMF studies exposures to humans and animals have been conducted world-wide and peer-reviewed by national and international organizations. Most have concluded that no association between EMF exposure from power lines and an increased risk to public health exist, with the exception of a possible weak link to childhood leukemia. It is for this reason that the National Institute of Environmental Health Sciences (NIEHS) and International Agency on Research on Cancer (IARC) has classified EMF as "possibly carcinogenic," but has not been classified it as "carcinogenic." Some epidemiological studies have suggested that EMF exposure may be linked to an increase in childhood leukemia rates. Most health organizations believe that this link is unsubstantiated due to the failure to find a process to explain health effects and the negative results from animal testing.

The NIEHS suggests that the level and strength of evidence supporting ELF-EMF exposure as a human health hazard are insufficient to warrant aggressive regulatory actions; thus, they do not recommend actions such as stringent standards on electric appliances and a national program to bury all transmission and distribution lines. Instead, the evidence suggests passive measures such as a continued emphasis on educating both the public and the regulated community on means aimed at reducing exposures. The NIEHS suggests that the power industry continue its current practice of siting power lines to reduce exposures and continue to explore ways to reduce the creation of magnetic fields around transmission and distribution lines without creating new hazards. The NIEHS encourages technologies that lower exposures from neighborhood distribution lines provided that they do not increase other risks, such as those from accidental electrocution or fire.

This Council heard conflicting testimony on the potential implications EMF may have on human health. The NIEHS, IARC, and World Health Organization (WHO) are not able to definitively

state that electric and magnetic fields do not cause cancer, even though the preponderance of evidence leans toward no impact to health. Because of this uncertainty, a prudent avoidance policy is shared by these organizations and others. The International Commission on Non-Ionizing Radiation Protection (ICNIRP) has established a health-based standard of 833 mG for the 60 hertz frequency. This standard is recognized by much of the European Union and many other countries world wide. Other standards include: New York, with a standard of 250 mG at maximum load at edge of ROW; Florida, with ranges between 150-250 mG at maximum load at edge of ROW; and the goal values identified by the Commonwealth of Massachusetts which observes a threshold of 85 mG at the edge of the ROW. Italy has a goal of 25 mG in areas where children congregate for more than four hours and Poland has established a level of 251 mG for exposures longer than eight hours.

a. Department of Public Health. The Connecticut Department of Public Health (DPH) participated in this proceeding at the request of the Council. DPH representative Dr. Gary Ginsberg provided comments and testimony on EMF. Dr. Ginsberg, a toxicologist, although not an expert on EMF matters, stated distance is the best mitigating tool to abate EMFs. Based on his understanding of EMF studies, Dr. Ginsberg advocated milligauss (mG) measurements to determine exposure level and testified levels below 3 mG, using time-weighted values, are within the realm of background EMF levels. Time weighted values between 3mG and 6 mG can reasonably be anticipated not to present an increased public health risk; however, time-weighted EMF levels above 6 mG have a larger public health concern. As Dr. Ginsberg emphasized, the DPH is a risk assessor not a risk manager and does not set or recommend standards; in fact, the DPH Comprehensive Public Health Plan is silent on EMF. Lastly, prudent avoidance, as defined by the DPH, means that magnetic field exposure should be avoided under circumstances that one can normally take within one's power and control, without consideration of economic investment. The Council agrees with the DPH that prudent avoidance is a worthwhile policy; however the Council does consider cost in its evaluation of prudent avoidance.

b. Prudent Avoidance. The Council's BMPs adopted a cautious approach also known as "prudent avoidance" and specifically identifies low-EMF design such as compact spacing, optimum phasing of conductors and applying new field management technologies. In addition, the World Health Organization explains that prudent avoidance "does not imply setting exposure limits at an arbitrarily low level and requiring that they be achieved regardless of cost, but rather adopting measures to reduce public exposure to EMF at modest cost". The Council determines that this facility, as approved, complies with our BMPs and the Applicants will be ordered to comply with the Council's BMPs in the construction of the facility.

The Applicants presented low-EMF designed structures and techniques at a reasonable cost. These mitigating measures include use of compact spacing and optimum phasing; and adjusting pole height and placement in the vicinity of statutory facilities. Therefore the Council will order the design of prudent avoidance configurations, as shown in Appendix B of the Findings of Fact, and permit the municipalities directly affected by the project to comment on the proposed design.

XIV. Buffer Zones

Public Act 04-246 protects the public health and safety of people, not places, with special emphasis on protecting the health and safety of children. For some parts of the proposed facility, the General Assembly requires the establishment of "a buffer zone that *protects the public health and safety*, as determined by the council." (*Italics* added.) Public Act 04-246 requires that the Council, in "establishing such buffer zone" "take into consideration" certain facilities. The Council believes that the purpose of the buffer zones is, to protect "public health and safety". Because the perceived threat to public health and safety is mainly potential EMF effects on children, the legislature accordingly required the Council to take into consideration those facilities where children are likely to congregate for a significant period of time.

The Council notes that the General Assembly gave the Council the responsibility to establish the buffer zone, but did not give the Council powers to even prohibit future building within it. The Council hereby establishes the buffer zone as the width of the right-of-way; however, it is within the duty of the utilities and municipal planning and zoning commissions to regulate the buffer zone as it relates to existing facilities and the prohibition of present and future building within the buffer zone. Because the Act and its legislative history indicate a concern with the health of children exposed to long term electric and magnetic fields from electric transmission lines, the establishment of a buffer zone should have no effect on roads or railroads crossing such zones, or facilities not typically frequented by children, such as golf courses, most commercial establishments, factories, and the like.

XV. Residential Area

Today development and housing expansion have been placed much closer to most rights-of-way, and electric transmission lines are no exception. Typical rights-of-way (i.e. for highways, gas pipelines, electric transmission lines and railways) traverse areas of open space, cross residential areas, and serve some commercial/industrial parks. Most of the existing electric transmission line rights-of-way were established between 40 to 80 years ago in areas where population density and development of suburban and rural areas was low.

The Connecticut legislature lists areas of concern in Public Act 04-246 as "residential areas, public and private schools, licensed child day care facilities, licensed youth camps or public playgrounds" and requires that 345-kV lines be installed underground unless "technologically infeasible", harming the reliability of the electric system.

The provisions of the Act that concern "residential areas" are intended to protect "public health and safety", and not economic or other interests. We also note that the Act uses the term "residential areas" to be considered, along with facilities where children tend to congregate for a significant period of time, such as schools, day care facilities and the like, and does not use the term "residences", suggesting that the legislature meant by "residential area" what is commonly called a neighborhood. The crucial aim of the legislature was to protect people, particularly children, and not individual buildings. Thus, the Council will define "residential areas" as being areas where people actually live, neighborhoods, not places they might live in the future.

XVI. Approved Route Deviations from the Proposed Plan

Route deviations have been provided for consideration based on EMF exposure at the following locations: Royal Oak neighborhood, Durham; B'Nai Jacob Congregation, Woodbridge; and the Jewish Community Center (JCC), Woodbridge.

a. Royal Oak. In the area of the Royal Oaks subdivision on the Middletown/Durham town line residences have gradually developed up to the existing transmission line ROW. The City of Middletown and the Town of Durham have asked that the transmission line bypass the Royal Oaks neighborhood. This detour, as proposed by the Applicants, has been labeled the Royal Oak Bypass, which would skirt the neighborhood slightly to the north across undeveloped land across Route 17 and turn south to rejoin the existing right-of-way. This would require acquisition of a new 1.1 mile long by 125 foot wide right-of-way from six land owners, potentially impact wetlands and undiscovered cultural resources, and bisect a property proposed as a 25 home subdivision.

Initially, the Council may not have considered deviating from an existing electric transmission line right-of-way. However, because the Royal Oaks neighborhood and existing right-of-way are intertwined specifically via a special agreement between CL&P and the Royal Oak neighbors for vegetation management within the ROW; the Council interprets this as a unique "residential" area. Moreover, the undeveloped area north of the Royal Oaks neighborhood is essentially uninhabited and provides a reasonable corridor to protect the public health and safety of an existing neighborhood. The suggested bypass appears rational, appropriate, and the Applicant does not object to it; therefore, the Council will order the construction of the Royal Oak Bypass which shall include rights-of-way not to exceed a total of 165 feet in width for the proposed 345-kV transmission line and leave the existing 115-kV ROW in place. Furthermore, the minimum buffer zone is the existing right-of-way.

b. Congregation B'Nai Jacob / Ezra Academy. Congregation B'Nai Jacob / Ezra Academy is seeking to shift the existing right-of-way farther north onto another property that is also encumbered with an existing right-of-way. The Council will direct the Applicants to shift the right-of-way within Congregation B'Nai Jacob/ Ezra Academy property farther away from its buildings.

c. Jewish Community Center. The Jewish Community Center (JCC) requested the proposed 345/115-kV transmission lines be re-aligned to provide an adequate buffer from children using its community center and day camp operations. The Council orders the use of the center of the ROW and prudent avoidance low-EMF structures.

XVII. Construction

a. Overhead Route. General construction activities for an overhead line first require soil borings at structure locations, flagging of wetlands, and surveying the ROW. Equipment used for this activity would generally consist of pickups and other small trucks. Equipment to be used includes the brush hog, bucket trucks for canopy trimming, and wood chippers for vegetation removal followed with a bulldozer, crushed stone, culverts to cross wet areas, wooden mats for work in wetlands to improve existing access roads or to construct new access roads to a width of 12 to 15 feet with grades of typically less than ten percent. These roads are necessary for

oversized vehicles, cranes, and cement trucks for the installation of foundations and structures. The size of a structure work site would usually be limited to the ROW width or an area approximately 100 by 100 feet. Along the overhead portions of the project, no direct construction related impacts to watercourses are expected. Fording streams should be avoided where possible during and after construction however if crossings are needed, the Applicants are directed to consult with the DEP.

Staging and equipment lay-down areas would involve the same process and equipment as for access roads unless the proposed sites are already developed. Areas would be designated for the location of field office trailers, sanitary facilities and parking areas. The Council will order that the Applicants seek developed areas for staging and equipment lay-down, field office trailers, sanitary facilities and parking before clearing any vegetation as identified in a Development and Management Plan.

Excavated material in upland construction may be allowed to be graded in proximity to the structure and excavated soil in wetland construction shall be stockpiled in an upland area for use in wetland restoration. Any groundwater encountered during excavation shall be managed consistent with the best management practices for soil and erosion control.

Conductor installation would require a cleared area (50-70 feet by 100-200 feet) for pulling conductors and the Council will order such sites be within the existing ROW, and use existing cleared areas, to the extent possible; pulling sites will not be allowed in wetlands.

Removal of existing structures would use similar equipment to dismantle structures, such as reel cranes, trailers for old conductors, and construction trucks.

b. Underground Route. The underground installation of the cable would be installed State and local roadways. The Council will direct the applicant to use the encroachment permit process developed for the Docket No. 217 project as a template. Another concern in construction on busy roads is traffic management. This project will be within the Route 1 corridor for a majority of the 24 mile route. Night-time construction may be appropriate to reduce impacts to traffic; however, lighting and noise effects would be localized. The Council will require the Applicants to devise a traffic control plan to include scheduling the hours of construction during nights and/or weekends and the mitigation of lighting and noise as part of the D&M Plan.
Prior to beginning construction, businesses, landowners and residents would be notified of construction activity. Existing underground and above-ground infrastructure would be identified, and plans would be devised for the temporary or permanent relocation of other subsurface facilities. Staging areas, construction field offices and sanitary facilities would be established using available parking areas. Storage of construction material would be along roadsides at trenching locations. The Applicants would consult with the DOT and the local municipality for trenching. In areas where bedrock or boulders impede trenching, blasting maybe necessary and the Council will order a blasting plan be provided in the D&M plan. Groundwater encountered during construction shall be managed consistent with the best management practices for soil and erosion control.

For the crossings of rivers or other water bodies, the Applicants propose use of horizontal directional drilling ("HDD") or jack and bore to install the cable. This process also could be used beneath railroads, major highways, or congested intersections. The Council is aware that using HDD may have drilling fluid releases and will direct the Applicants to consult with the DEP concerning HDD and the jack and bore crossing techniques and the Applicant shall submit DEP permits and a Monitoring and Operations Plan for each water body crossing prior to construction. Also, HDD and jack and boring sites must be identified in the D&M Plan.

The Housatonic River crossing would impact a state-owned boat launch in Milford near I-95. The Applicants are directed to consult with the DEP on construction scheduling at the boat launch and the line should also be sited so as to not interfere unreasonably with any future maintenance needs.

Vaults would be installed at intervals of approximately 1800 to 2000 feet along the 24 mile route for splicing cable joints. The Council orders these vault locations be located in non-travel portions of roadways, to the extent possible, for the purpose of the 24 hour seven day joint splicing process.

Temporary paving would be used after backfilling the excavation and trenches. As sections of trenching are completed and storage areas restored to preconstruction condition, the Applicants would remove the temporary pavement and install a permanent pavement.

XVIII. Environment

a. Clearing. The existing transmission right-of-way has been in place for over 60 years with only periodic vegetative maintenance. The proposed construction ROW and the proposed temporary workspace areas would be cut and cleared of woody vegetation. The portions between Oxbow Junction and Beseck Switching Station and Cook Hill Junction and East Devon Substation would not require clearing. The Council is cognizant that access roads are needed for each transmission structure location. However, vegetation located within the construction ROW, but beyond the immediate area of structure foundations and pulling sites serves important functions. In addition to providing havens for wildlife, this vegetation provides visual buffers. Accordingly, the Council will order the Applicants to design a plan for vegetative clearing.

b. Wetlands. The Council is concerned that the proposed construction activities could change the values and functions of wetlands and vernal pools traversed by, or adjacent to, the proposed transmission line. The proposed placement of construction access roads in wetlands would result in the temporary filling of a wetland, which may change the nutrient and oxygen levels, vegetation types, and hydrology of the wetlands. Furthermore, the removal of vegetation and changes in wetland conditions may invite the establishment of invasive plants that may impair or cause a loss of biological diversity. The record identified numerous vernal pools and wetlands with high function as amphibian breeding sites. Consequently, the Council will order that vernal pools near construction activities be protected with construction fencing, a buffer area be established around wetlands; that an invasive species management plan be developed which includes provisions for post-construction monitoring and removal of excessive invasive plants; and that a wetland restoration plan be

developed to restore and improve the condition of wetlands disturbed by the proposed transmission line construction. A wetland restoration plan would promote native plant species and the habitats in which they occur, and decrease the time it would take to restore the transmission line ROW to pre-construction conditions. During modifications or upgrades of existing transmission lines, the Council seeks to improve the surrounding environs and directs the Applicants to address sensitive areas as identified by the DEP in the D&M Plan.

c. Endangered Species. The Connecticut DEP identified endangered, threatened or special concern species along the transmission line route. In the overhead portion of the proposed project, seven species were identified: blue winged teal and king rail are known to exist at Durham Meadows Wildlife Area in Durham and Middletown; wood turtles are found east of Ball Brook Middletown; eastern box turtles in the Beseck Mountain/Black Pond area of Middlefield, red-shouldered hawks in the area of Glen Lake, Woodbridge, and wood turtles in the Wepewaug River, Milford. In the underground portion of the project four species were identified: Atlantic sturgeon in the Housatonic River; peregrine falcon nest under the I-95 bridge; and two plant species, the mudwort and bayonet grass are in the Saugatuck River basin. Therefore, the Council orders the Applicants to conduct a pre-construction survey of endangered, threatened, or special concern species, flag areas of mudwort and bayonet grass, sweep areas for eastern box turtle and wood turtle prior to construction, and follow construction periods as outlined by the DEP Wildlife Division.

d. Landfill. The Applicants have proposed construction activity within or adjacent to former landfills, particularly, Middletown-Durham, Wallingford, and Westport landfills. Also, the East Devon Substation and Mill River crossing have soil contaminants. Furthermore, trenching may reveal contaminated soils. The Council instructs the Applicant to obtain the necessary waste management permit for activity in any solid waste disposal area and remove and dispose of contaminated soil per municipal, state, and federal regulations.

e. Archaeological and Historic. Numerous archaeological resources exist within 500 feet of the proposed 69 mile route, including prehistoric sites identified in Milford, Orange, and West Haven in the vicinity of the proposed route. One site is located at the proposed East Devon Substation site. No historic sites were identified within 600 feet of the proposed overhead route.

No archeological resources were identified along the underground route but numerous historic sites were noted. Sixteen locations are within 350 feet or adjacent to the proposed route. These resources are primarily in Bridgeport with a few in Westport and Fairfield. The proposed supported change in Westport averts the Kings Highway North Historic District and would not be impacted by the proposed project.

Because structure heights may be modified for magnetic field mitigation and may impact archeological and historic resources, the Council will order the Applicants to coordinate with the Connecticut Historic Commission for further archeological surveys, included but not limited to, the East Devon Substation site and significant historic sites.

f. Visibility. In general, low magnetic field design structures would be taller than the structures proposed, requiring structure foundations be comparatively larger. For example, the foundation diameter of a 105-foot-tall structure would be approximately 4 to 6 feet, whereas the foundation diameter of a 150-foot-tall structure would be between 6 and 8 feet. A 182 to 190-foot-tall structure would have a wider foundation (probably 10 to 12 feet in diameter). Angle structures would also require larger diameter foundations. Taller structures would have to be more deeply embedded in the ground. The environmental effects would increase potential structure visibility (due to the comparatively greater height of the structures or to modifications in the planned reconstruction of existing transmission lines), additional land disturbance to install the larger foundations associated with taller structures or for access roads to reach new structure sites, and possibly additional vegetation clearing (in some areas), to maintain clearances from the conductors along access roads.

g. Coastal Zone. The East Devon and Singer substations are both planned for industrially-zoned sites that are set back at least 1,000 feet from the coast line which has triggered an application process with the DEP, Office of Long Island Sound Programs (OLISP) for coastal permits. The applicants shall provide copies of permits prior to construction of the substations.

h. Erosion and Sediment Control. Both overhead and underground construction will be involved, and, as part of the D&M Plan, the Applicants shall provide an erosion and sediment control plan consistent with the 2002 Connecticut Guidelines for Erosion and Sediment Control.

XIX. Cost

The legislature has charged the Council to provide for the balancing of the need for adequate and reliable public utility services at the lowest reasonable cost to consumers with the need to protect the environment and ecology of the state. Further, undergrounding of 345-kV transmission cables must be maximized to the extent possible consistent with reliability and that the cost would not be unreasonable to the people of Connecticut. Thus, costs only play a role when and if a point is reached where the proposed facility becomes unreasonably costly. The prudent avoidance measures applied in this docket may add up to 80 million dollars to the cost of the overhead portion of the project. Prudent avoidance costs for underground transmission have not been estimated.

A 345-kV transmission system is more efficient than systems operating at a lower voltage. Losses on a 345-kV system are only about 1/9 of those on a 115-kV system for the same energy transfer - a reduction in losses which displaces generation in Connecticut or elsewhere that otherwise would have to operate to serve the load and are less expensive. Reducing the generation requirement lowers costs and reduces air emissions. Modeling for the peak loading periods revealed losses approximately 35 MW lower with the 345-kV system than with the 115-kV system, which is approximately enough savings to power about 35,000 homes.

XX. Water Supply

The proposed overhead route would traverse miles of the South Central Regional Water Authority (SCRWA) watershed land primarily in Bethany, Woodbridge, and West Haven. Public water supply is a matter of public health and safety and to protect the integrity of the water

supply, the Council will order a DPH change -in-use permit be submitted prior to the commencement of construction on public water supply land, and provisions to protect the watershed as identified by the SCRWA.

XXI. Conclusions

There is a public need for the facility approved by this Council in the Opinion, Decision and Order.

The facility approved by this Council in the Opinion, Decision and Order will be reliable.

The nature of the probable environmental impact, including EMF of the facility alone and cumulatively with other existing facilities has been reviewed by this Council in approving this facility. Included in the review of the probable environmental impact was a review of electromagnetic fields. The Council has examined the policies of the State concerning the natural environment, ecological balance, public health and safety, air and water purity, and fish, aquaculture and wildlife, together with all other environmental concerns, and balanced the interests in accordance with Conn. Gen. Stat. § 16-50p(a)(3)(B) and Conn. Gen. Stat. § 16-50p(a)(3)(C).

The environmental effects that are the subject of Conn. Gen. Stat. § 16-50p (a) (3) (B) can be sufficiently mitigated and do not overcome the public need for the facility approved by the Council in the Opinion, Decision and Order.

Conn. Gen. Stat. § 16-50p(a)(3)(D)(i) requires that the Council specify what part, if any, of the facility approved shall be located overhead. That is designated in this Opinion, Decision and Order.

The facility approved by this Council in the Opinion, Decision and Order conforms to a long-range plan for expansion of the electric power grid of the electric systems serving the State of Connecticut and its people and interconnected utility systems and will serve the interests of electric system economy and reliability.

The overhead portions of the facility approved by this Council in its Opinion, Decision and Order are cost effective and the most appropriate alternative based on a life-cycle cost analysis of the facility and underground alternatives to the facility and complies with the provisions of Public Act No. 04-246. The 45-mile overhead portions between Scovill Rock Substation and the proposed East Devon Substation are approved by this Council in its Opinion, Decision and Order, are consistent with the purposes of Chapter 227a of the General Statutes of Connecticut, and with Council regulations and standards adopted pursuant to Conn. Gen. Stat. § 16-50t, including the Council's best management practices for electric and magnetic fields for electric lines and with the Federal Power Commission "Guidelines for the Protection of Natural Historic Scenic and Recreational Values in the Design and Location of Rights-of-Way and Transmission Facilities" or any successor guidelines and any other applicable federal guidelines.

The overhead portions of the facility approved by this Council in its Opinion, Decision and Order are contained within the buffer zone, no less in area than the existing right-of-way that protects the public health and safety. In establishing this buffer zone, the Council took into consideration, among other things, residential areas, private or public schools, licensed child daycare facilities, licensed youth camps or public playgrounds adjacent to the proposed overhead route of the

overhead portions and the level of voltage of the overhead portions and any existing overhead transmission lines on the approved route.

This proceeding consisted of over 35 days of hearings and procedural meetings, eight field inspections of the proposed routes, a review of over 300 exhibits and the filing of over a thousand letters from the public over a period of 18 months. The Council's ultimate decision reflects the balance required by Connecticut law to protect the environment, protect the public health and safety of our children, and to secure Connecticut's energy future for generations to come.

The Connecticut Siting Council appreciates the extraordinary public participation in this docket. We further appreciate the dedicated efforts of all elected officials and experts for their significant contributions to this docket in addressing public health and safety concerns.