

July 26, 2016

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

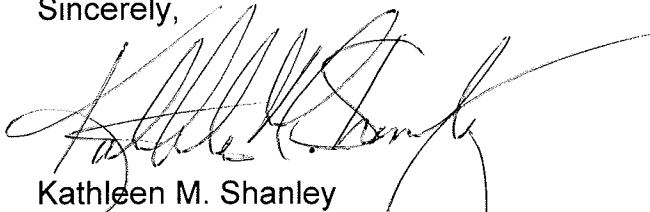
Dear Chairman Stein:

The Connecticut Light and Power Company doing business as Eversource Energy ("Eversource") submits the attached original and two (2) copies of a Notice of Exempt Modification for modifications to an existing wireless communications facility located at 330 Pokorny Road in Haddam, Connecticut. Eversource is requesting a determination that no Certificate of Environmental Compatibility and Public Need is required for the proposed modifications to this existing wireless communication facility in Haddam.

Also attached is a check for the filing fee in the amount of \$625.

A notice has been provided to the First Selectman of the Town of Haddam.

Sincerely,



Kathleen M. Shanley
Manager - Transmission Siting

Attachments:

- Exempt Modification Notice
- Project Plans
- Structural Summary Letter
- Calculated Radio Frequency Emissions Report

cc: Ms. Lizz Milardo, First Selectman of Haddam

THE CONNECTICUT LIGHT AND POWER COMPANY DOING BUSINESS AS EVERSOURCE ENERGY

NOTICE OF EXEMPT MODIFICATION OF A TELECOMMUNICATIONS FACILITY IN THE TOWN OF HADDAM, CONNECTICUT

I. Introduction

Pursuant to the Regulations of Connecticut State Agencies (“RCSA”) section 16-50j-72(b), The Connecticut Light and Power Company doing business as Eversource Energy (“Eversource”) hereby gives notice to the Connecticut Siting Council (the “Council”) and the town of Haddam of its intent to undertake an exempt modification to an existing wireless communications facility located at 330 Pokorny Road, Haddam, Connecticut (the “Property”). The latitude and longitude of the Property are 41° 26' 36.9" N and 72° 33' 58.9" W, respectively. Specifically, Eversource plans to install one new microwave antenna on the existing tower and install a microwave transceiver in an existing equipment shelter at this location. Under the Council’s regulations (RCSA Sec. 16-50j-72(b), Eversource’s plans do not constitute a modification that is subject to Council review because Eversource will not change the height of the tower, will not extend the boundaries of the compound, will not increase the noise levels at the site and will not increase the total radio frequency electromagnetic radiation power density at the site to levels above applicable standards.

II. Background

Eversource currently owns the Property and a 280-foot tall steel lattice tower, which was erected on the Property in 2012, along with a shelter to house communications equipment. Since that time, the tower has been in continual use supporting Eversource’s two-way radio and microwave communication antennas. Including the top-mounted antennas, this telecommunications facility is approximately 299-feet tall.

Eversource recently employed CENTEK Engineering (“CENTEK”) to conduct an analysis of the tower to determine its structural loading capabilities. The results of this analysis indicate that the tower in its current state, along with the additional proposed microwave antenna, will continue to comply with the TIA/EIA-222-F standard, as it relates to tower loading, as required by the Connecticut General Statutes. A letter summarizing the structural analysis is included as Attachment 2: Structural Summary Letter.

III. Proposed Modifications

Eversource proposes to mount one 6-foot diameter microwave dish at 240 feet above ground level. The microwave antenna will aim toward the northwest and will be mounted to the tower leg with standard 6 inch offset and tieback pipe-to-leg mounts. Eversource also proposes to install a microwave transceiver in the existing shelter that currently houses other Eversource communications equipment. For elevation and location drawings of the proposed installations, please see Attachment 1: Project Plans.

The proposed modifications will be contained entirely within the existing fenced compound. After construction is complete, the proposed installations would not generate the need for any additional traffic/visitations to the Property beyond that currently undertaken for routine maintenance. Maintenance on the new equipment will be performed during these periodic visits for maintaining the existing facilities.

The nearest residence is approximately 200 feet northwest of the tower. No wetlands or wildlife habitat areas, per the Connecticut Department of Energy and Environmental Protection’s

Natural Diversity Data Base, were identified near the facility. The visual impact of the modifications will be somewhat mitigated at ground level in close proximity to the facility by existing vegetative screening (trees) on all sides of the Property. The additional antenna is not anticipated to result in a significant change to the appearance of the tower from more distant views.

Radio-signal emissions from the existing and proposed equipment at this site will not exceed the total radio-frequency ("RF") electromagnetic power-density level permitted by the Federal Communications Commission ("FCC"). To ensure compliance with the applicable standard, Eversource hired C-Squared Systems to perform an analysis of the effect of the proposed addition combined with existing power density levels. The analysis was performed in accordance with FCC guidelines, as amended in August 1997 by the Office of Engineering & Technology Bulletin 65 Edition 97-01. The analysis results indicate that the addition would add 2.14% to the Maximum Permissible Exposure ("MPE") level for public exposure (please see Table 1, last line, of Attachment 3: Calculated Radio Frequency Emissions Report). Combined with existing levels, the entire facility would not exceed 23.44% of the MPE level for public exposure.

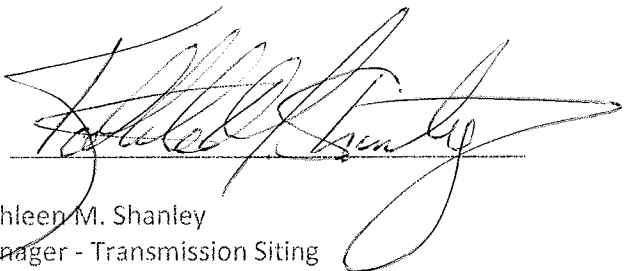
Installation of the new antenna and the microwave transceiver is scheduled to begin in summer 2016. It is anticipated that all construction will be completed by the end of 2016.

Eversource respectfully submits that the proposed installations (a new microwave dish antenna to the Tower and one new microwave transceiver in the shelter) do not constitute a modification subject to the Council's jurisdiction.

Communications regarding this Notification of Exempt Modification should be directed to:

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

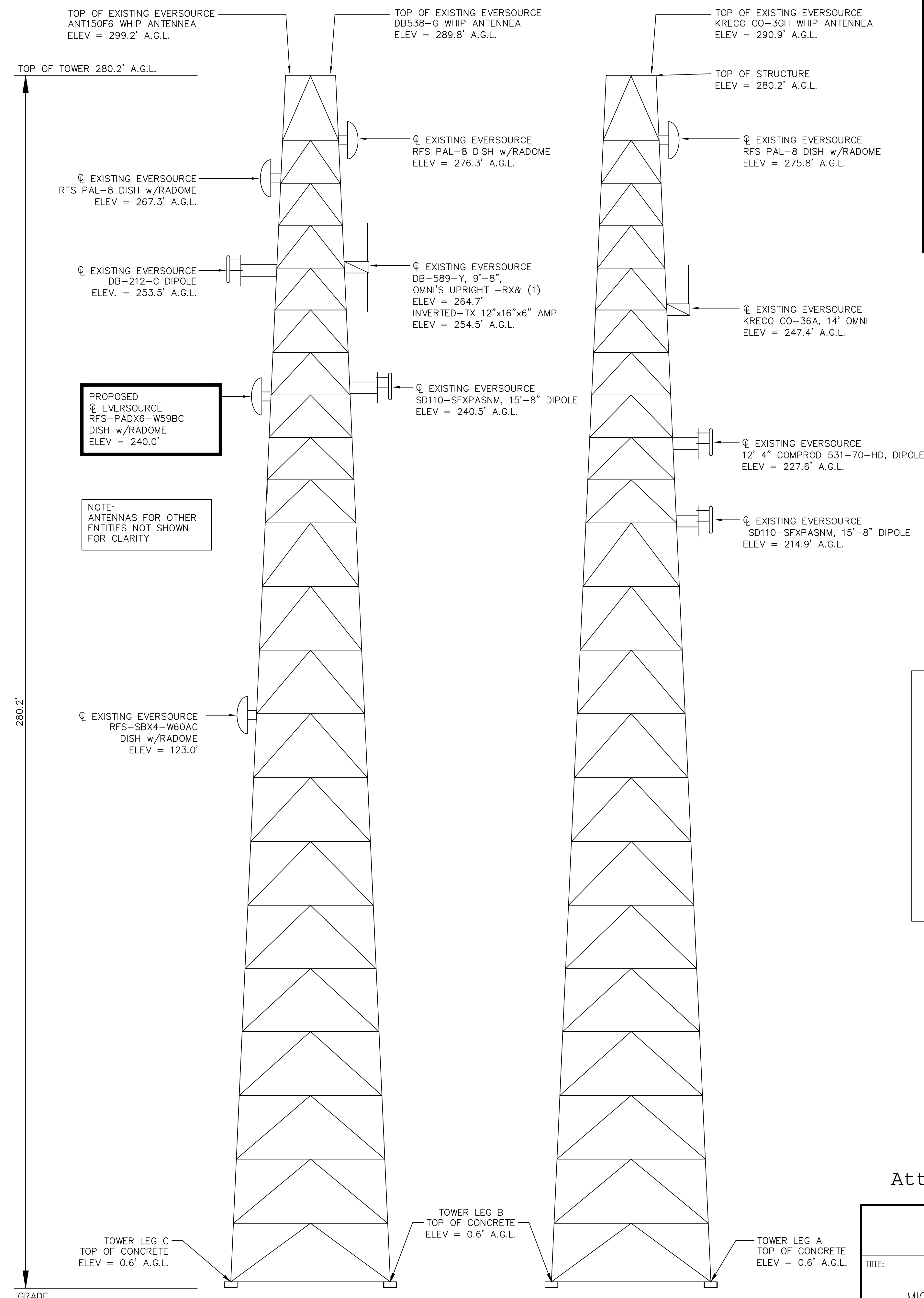
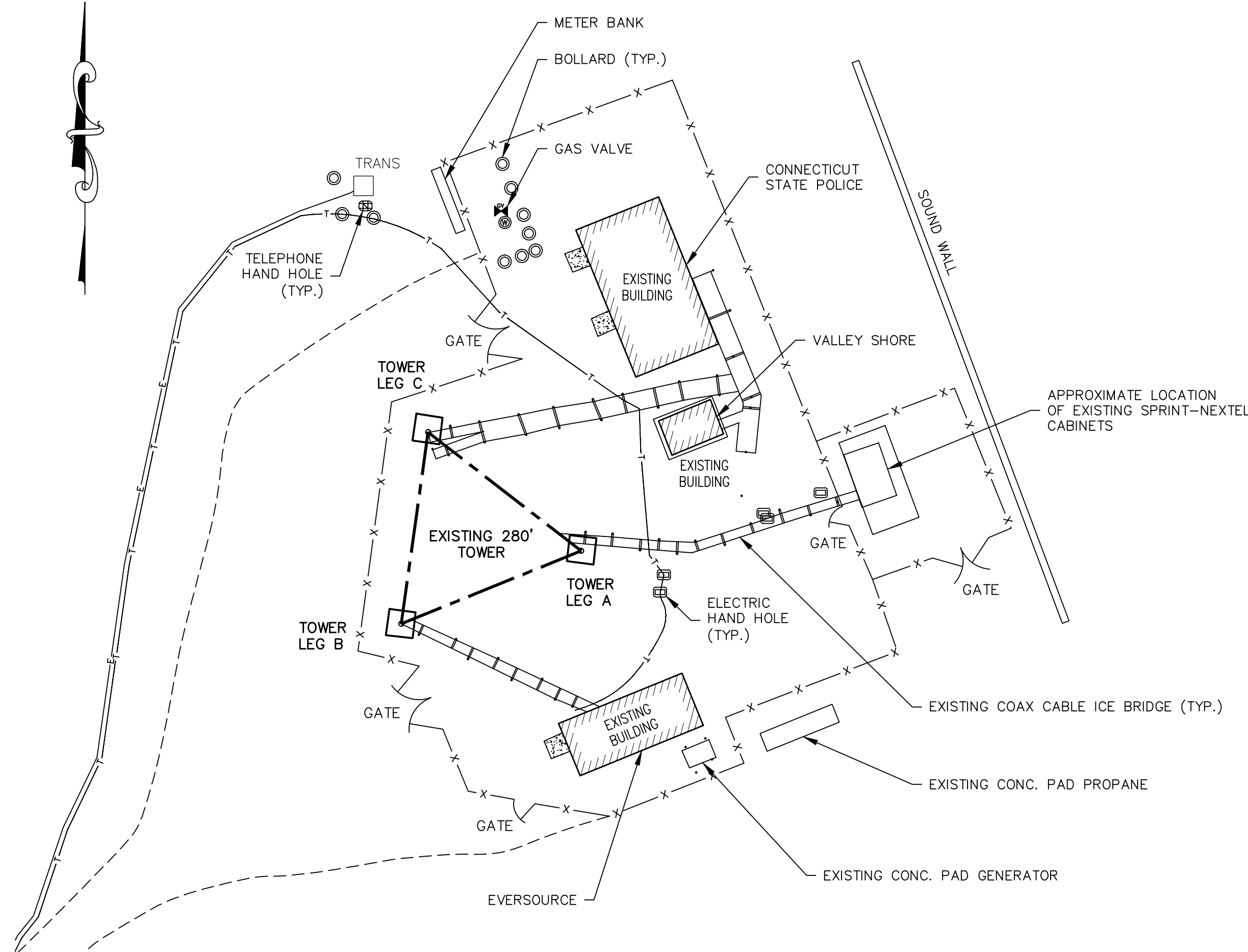
EVERSOURCE ENERGY

By: 
Kathleen M. Shanley
Manager - Transmission Siting

Attachments:

- Attachment 1: Project Plans
- Attachment 2: Structural Summary Letter
- Attachment 3: Calculated Radio Frequency Emissions Report

**PROPOSED
ANTENNA MAODEL — RFS-PADX6-W59BC
6 FOOT DIA. MICROWAVE DISH W/ RADOME
@ 240.0' CENTERLINE LEG (C)**



☉ TOWER LOCATION
GRADE ELEV. = 656.0'
TOP FDTN = 656.6'
TOP TOWER = 936.2'
N: 722407.97'
E: 1050326.14'
LAT: N 41°-26'-36.9"
LONG: W 72°-33'-58.9"
NAD 83
NAVD 88

Attachment 1

EVERSOURCE ENERGY			
CONNECTICUT			
TITLE: COMPOUND PLAN TOWER ELEVATIONS AND DETAILS MICROWAVE TOWER 330 POKORNY ROAD HADDAM, CT			
BY: TAL	CHKD: SAS	APP:	APP:
DATE: 2/10/2015	DATE: 2/10/2015	DATE:	DATE:
H-SCALE: 1" = 20'	SIZE: ARCH D	SURVEY JOB #:	C14-151
V-SCALE: N.T.S.	V.S.: Z-1-3	R.E.DWG.:	23568
R.E. PROJ. NUMBER: 060-02.006		NUSCO:	



Centered on SolutionsSM

June 7, 2016

Mr. Steven Florio
IT Telecommunications Engineering
Eversource Energy
Building NUE2, 2nd Floor
107 Selden Street
Berlin, CT 06037

Re: *Structural Summary Letter*
Eversource Energy ~ Goose Hill
330 Pokorny Road
Haddam, CT 06441

Centek Project No. 16095.00

Dear Mr. Florio,

Centek Engineering has been authorized by Eversource Energy to perform a structural analysis of the proposed antenna installation on the existing 280-ft self-support lattice tower structure at the above referenced site. The results of the analysis are summarized in this letter. Refer to structural analysis prepared by Centek; Job. No. 16095.00, dated June 7, 2016 signed and sealed by Timothy Lynn, PE (CT PE License No. 29336) for detailed calculations.

Per Section 3108 of the Connecticut State Building Code, the TIA/EIA-222-F "Structural Standards for Steel Antenna Towers and Antenna Supporting Structures" governs the structural design for this project. Additionally, Section 3108.4.2 of the CSBC requiring foundations and anchorages to resist two times the calculated wind load must also be satisfied. The proposed antenna installation meets the requirements of the TIA/EIA-222-F Standard and NU SUB-090 considering the basic wind speed (fastest mile) of 85 mph for Middlesex County.

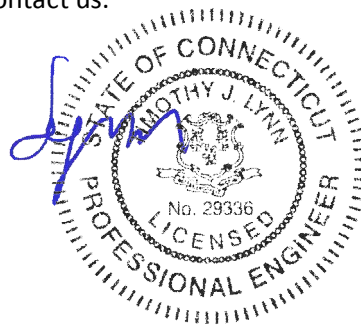
The maximum tower steel usage ratio is **0.817 (81.7%)** considering a one third increase in allowable stress as permitted by ANSI TIA-222-F. The foundation was found to be in conformance with Section 3108.4.2 of the 2005 Connecticut State Building Code.

Based on our structural analysis the proposed installation is in conformance with the applicable structural requirements of the State Building Code. Should you have any questions, please do not hesitate to contact us.

Respectfully Submitted by:

A handwritten signature in blue ink that reads "Timothy J. Lynn".

Timothy J. Lynn, PE
Structural Engineer





C Squared Systems, LLC
65 Dartmouth Drive
Auburn, NH 03032
(603) 644-2800
support@csquaredsystems.com

Calculated Radio Frequency Emissions Report



330 Pokorny Road, Haddam, CT 06441

(aka: Goose Hill)

June 10, 2016

Table of Contents

1. Introduction.....	1
2. FCC Guidelines for Evaluating RF Radiation Exposure Limits.....	1
3. RF Exposure Prediction Methods.....	2
4. Calculation Results.....	3
5. Conclusion.....	4
6. Statement of Certification.....	4
Attachment A: References.....	5
Attachment B: FCC Limits for Maximum Permissible Exposure (MPE).....	6
Attachment C: Antenna Data Sheet and Electrical Pattern.....	8

List of Tables

Table 1: Carrier Information.....	3
Table 2: FCC Limits for Maximum Permissible Exposure (MPE).....	6

List of Figures

Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE).....	7
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1. Introduction

The purpose of this report is to investigate compliance with applicable FCC regulations for Eversource Energy's (formerly Northeast Utilities) proposed additions to the existing guyed tower located at 330 Pokorny Road in Haddam, CT. The coordinates of the tower are 41° 26' 36.9" N, 72° 33' 58.9" W.

Eversource Energy is proposing the following:

- 1) Add one RFS 6 GHz microwave dish (model PADX6-W59BC), at a centerline of 240'.

2. FCC Guidelines for Evaluating RF Radiation Exposure Limits

In 1985, the FCC established rules to regulate radio frequency (RF) exposure from FCC licensed antenna facilities. In 1996, the FCC updated these rules, which were further amended in August 1997 by OET Bulletin 65 Edition 97-01. These new rules include Maximum Permissible Exposure (MPE) limits for transmitters operating between 300 kHz and 100 GHz. The FCC MPE limits are based upon those recommended by the National Council on Radiation Protection and Measurements (NCRP), developed by the Institute of Electrical and Electronics Engineers, Inc., (IEEE) and adopted by the American National Standards Institute (ANSI).

The FCC general population/uncontrolled limits set the maximum exposure to which most people may be subjected. General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

Public exposure to radio frequencies is regulated and enforced in units of milliwatts per square centimeter (mW/cm^2). The general population exposure limits for the various frequency ranges are defined in the attached "FCC Limits for Maximum Permissible Exposure (MPE)" in Attachment B of this report.

Higher exposure limits are permitted under the occupational/controlled exposure category, but only for persons who are exposed as a consequence of their employment and who have been made fully aware of the potential for exposure, and they must be able to exercise control over their exposure. General population/uncontrolled limits are five times more stringent than the levels that are acceptable for occupational, or radio frequency trained individuals. Attachment B contains excerpts from OET Bulletin 65 and defines the Maximum Exposure Limit.

Finally, it should be noted that the MPE limits adopted by the FCC for both general population/uncontrolled exposure and for occupational/controlled exposure incorporate a substantial margin of safety and have been established to be well below levels generally accepted as having the potential to cause adverse health effects.

3. RF Exposure Prediction Methods

The emission field calculation results displayed in the following figures were generated using the following formula as outlined in FCC bulletin OET 65:

$$\text{Power Density} = \left(\frac{1.6^2 \times EIRP}{4\pi \times R^2} \right) \times \text{Off Beam Loss}$$

Where:

EIRP = Effective Isotropic Radiated Power

$$R = \text{Radial Distance} = \sqrt{(H^2 + V^2)}$$

H = Horizontal Distance from antenna in meters

V = Vertical Distance from radiation center of antenna in meters

Ground reflection factor of 1.6

Off Beam Loss is determined by the selected antenna pattern

These calculations assume that the antennas are operating at 100 percent capacity and power, and that all channels are transmitting simultaneously. Obstructions (trees, buildings, etc.) that would normally attenuate the signal are not taken into account. The calculations assume even terrain in the area of study and do not take into account actual terrain elevations which could attenuate the signal. As a result, the predicted signal levels reported below are much higher than the actual signal levels will be from the final site configuration.

4. Calculation Results

Table 1 below outlines the power density information for the site. The proposed Eversource Energy microwave dish has a very narrow beamwidth which causes the majority of the RF power to be focused out towards the horizon, with respect to the vertical plane. As a result, there will be less RF power directed below the antenna relative to the horizon, and consequently lower power density levels around the base of the tower. Please refer to Attachment C for the vertical pattern of the proposed Eversource Energy microwave dish being added to this tower. The calculated results for Eversource Energy in Table 1 include a nominal 10 dB off-beam pattern loss to account for the lower relative gain below the antenna.

Carrier	Antenna Height (Feet)	Operating Frequency (MHz)	Number of Trans.	ERP Per Transmitter (Watts)	Power Density (mw/cm ²)	Limit	%MPE
Sprint	144	1950	11	433	0.0074	1.0000	0.74%
Eversource Energy	251	37.1	1	501	0.0010	0.2000	0.52%
Eversource Energy	274	150	1	335	0.0006	0.2000	0.29%
Eversource Energy	274	166	1	335	0.0006	0.2000	0.29%
Eversource Energy	274	450	1	2500	0.0011	0.3000	0.36%
Eversource Energy	154	157	1	335	0.0018	0.2000	0.91%
Eversource Energy	214	150	1	1005	0.0028	0.2000	1.42%
Eversource Energy	74	47.96	1	100	0.0024	0.2000	1.18%
Eversource Energy	123	6123.1	1	776	0.0018	1.0000	0.18%
Middlesex Fire	274	45.98	1	100	0.0002	0.2000	0.09%
Haddam Fire	64	46.24	1	316	0.0100	0.2000	4.99%
Operations	214	42.06	1	178	0.0005	0.2000	0.25%
NL County Fire	111	33.76	1	316	0.0033	0.2000	1.66%
MED 9	244	460	1	150	0.0001	0.3067	0.03%
Hi-Band TRP-TRP	144	150	1	878	0.0055	0.2000	2.74%
Operations	114	450	1	398	0.0010	0.3000	0.33%
MS to Talcott	269	6805	1	9927	0.0005	1.0000	0.05%
MW to CT Yankee	269	6815	1	9957	0.0005	1.0000	0.05%
MW to Madison	269	6785	1	9869	0.0005	1.0000	0.05%
MW to Talcott	194	6000	1	845	0.0001	1.0000	0.01%
MW to Millstone	194	6000	2	9782	0.0019	1.0000	0.19%
MW to Troop F	187	6525	1	5413	0.0006	1.0000	0.06%
MW to Mt. Besock	185	6525	1	5413	0.0006	1.0000	0.06%
MW to Jenks Hill	94	17700	1	18741	0.0076	1.0000	0.76%
Troop F 800 MHz	169	866	5	200	0.0005	0.5773	0.09%
Troop K 800 MHz	234	866	5	200	0.0005	0.5773	0.09%
Interop 800 MHz	169	866	5	200	0.0005	0.5773	0.09%
Educational TV	234	2500	1	151	0.0000	1.0000	0.00%
VoiceStream	125	1930	8	208	0.0383	1.0000	3.83%
Eversource Energy	240	6256	1	3428	0.0214	1.0000	2.14%
						Total	23.44%

Table 1: Carrier Information^{1,2}

¹ The power density information for carriers other than Eversource was taken directly from the CSC database dated 5/4/2015. Please note that %MPE values listed are rounded to two decimal points. The total %MPE listed is a summation of each unrounded contribution. Therefore, summing each rounded value may not reflect the total value listed in the table.

² Please note that as of February 2, 2015, Northeast Utilities is operating in the marketplace as Eversource Energy. Table 1 has been updated to reflect the company name change.

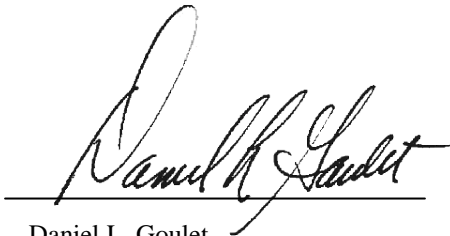
5. Conclusion

The above analysis verifies that RF emissions from the site, after the proposed modifications have been completed, will be below the maximum power density levels as outlined by the FCC in the OET Bulletin 65 Ed. 97-01. Even when using conservative methods, the cumulative power density from the proposed and existing transmit antennas is well below the limits for the general public. The highest expected percent of Maximum Permissible Exposure at ground level is **23.44% of the FCC General Population/Uncontrolled limit.**

As noted previously, obstructions (trees, buildings, etc.) that would normally attenuate the signal are not taken into account. As a result, the predicted signal levels are more conservative (higher) than the actual signal levels will be from the final site configuration.

6. Statement of Certification

I certify to the best of my knowledge that the statements in this report are true and accurate. The calculations follow guidelines set forth in ANSI/IEEE Std. C95.3, ANSI/IEEE Std. C95.1 and FCC OET Bulletin 65 Edition 97-01.



Daniel L. Goulet
C Squared Systems, LLC

June 10, 2016

Date

Attachment A: References

OET Bulletin 65 - Edition 97-01 - August 1997 Federal Communications Commission Office of Engineering & Technology

ANSI C95.1-1982, American National Standard Safety Levels With Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 300 kHz to 100 GHz. IEEE-SA Standards Board

IEEE Std C95.3-1991 (Reaff 1997), IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave. IEEE-SA Standards Board

Attachment B: FCC Limits for Maximum Permissible Exposure (MPE)

(A) Limits for Occupational/Controlled Exposure³

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f ²)*	6
30-300	61.4	0.163	1.0	6
300-1500	-	-	f/300	6
1500-100,000	-	-	5	6

(B) Limits for General Population/Uncontrolled Exposure⁴

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f ²)*	30
30-300	27.5	0.073	0.2	30
300-1500	-	-	f/1500	30
1500-100,000	-	-	1.0	30

f = frequency in MHz * Plane-wave equivalent power density

Table 2: FCC Limits for Maximum Permissible Exposure (MPE)

³ Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

⁴ General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

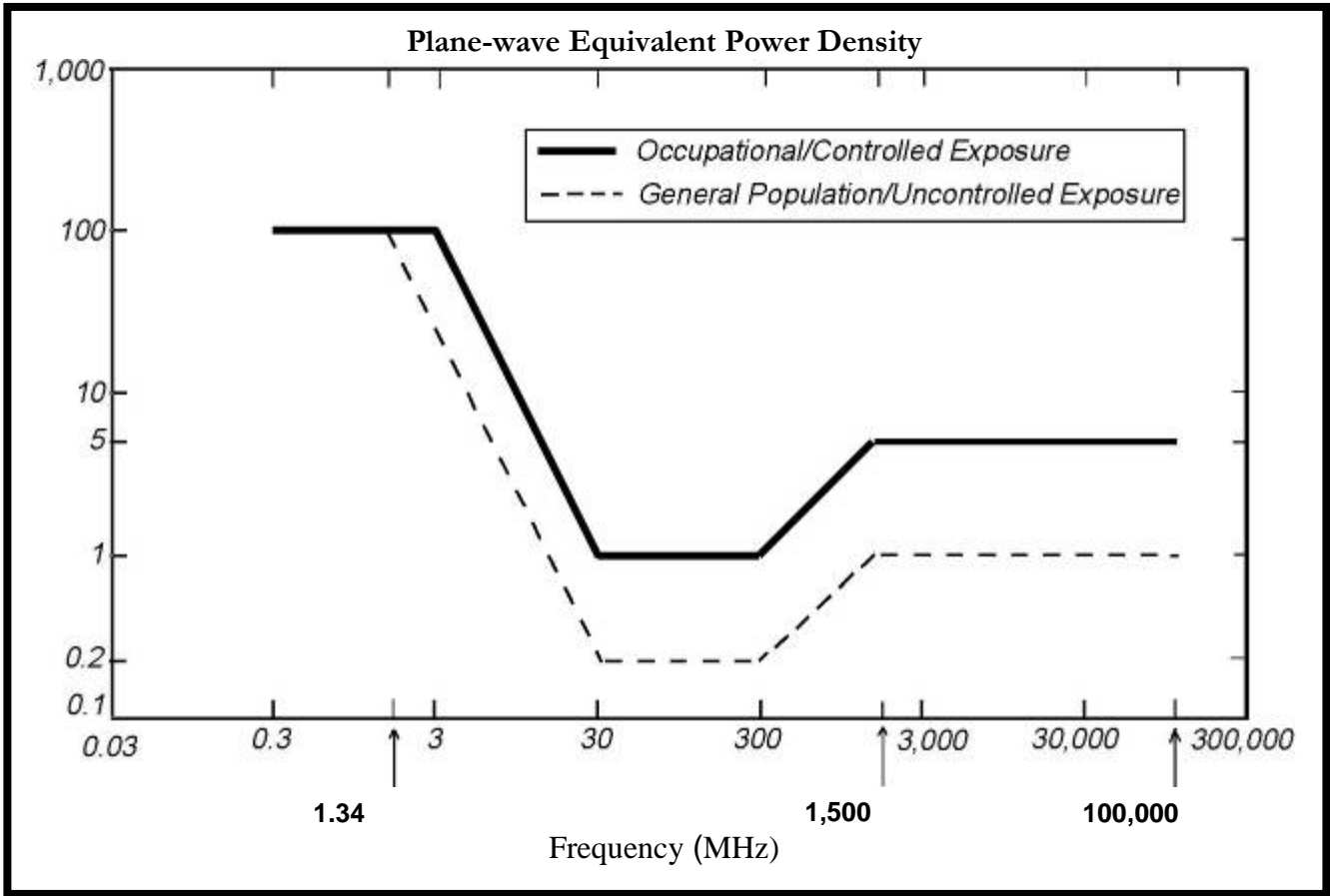


Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

Attachment C: Antenna Data Sheet and Electrical Pattern

