STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
Web Site: portal.ct.gov/csc

VIA ELECTRONIC MAIL

February 1, 2023

Kenneth C. Baldwin, Esq.
Robinson & Cole
280 Trumbull Street
Hartford, CT 06103
kbaldwin@rc.com

RE: **EM-VER-126-221222 –** Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 162 Birdseye Road, Shelton, Connecticut.

Dear Attorney Baldwin:

The Connecticut Siting Council (Council) is in receipt of your correspondence of January 18, 2023 and February 1, 2023 submitted in response to the Council's January 4, 2023 and January 19, 2023 notifications of an incomplete request for exempt modification with regard to the above-referenced matter.

The submission renders the request for exempt modification complete and the Council will process the request in accordance with the Federal Communications Commission 60-day timeframe.

Thank you for your attention and cooperation.

Sincerely,

Melanie Bachman
Executive Director

MAB/ANM/laf

Robinson+Cole

KENNETH C. BALDWIN

280 Trumbull Street
Hartford, CT 06103-3597
Main (860) 275-8200
Fax (860) 275-8299
kbaldwin@rc.com
Direct (860) 275-8345

Also admitted in Massachusetts
and New York

February 1, 2023

Melanie A. Bachman, Esq.
Executive Director/Staff Attorney
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: **EM-VER-126-221222 – Cellco Partnership d/b/a Verizon Wireless – 162 Birdseye Road, Shelton, Connecticut**

Dear Attorney Bachman:

In accordance with the Siting Council's January 19, 2023 letter, enclosed is a copy of a revised Radio Frequency Emissions Analysis Report, prepared by EBI Consulting, relating to the above referenced facility modification filing.

Please contact me if you have any questions regarding this proposal.

Sincerely,

Kenneth C. Baldwin

Attachments

EBI Consulting

environmental | engineering | due diligence

RADIO FREQUENCY EMISSIONS ANALYSIS REPORT
EVALUATION OF HUMAN EXPOSURE POTENTIAL TO NON-IONIZING EMISSIONS

Verizon Existing Facility

Site ID: 467929

Shelton North CT
161 Birdseye Road
Shelton, Connecticut 06484

January 31, 2023

EBI Project Number: 6223000311

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**4.05%**

January 31, 2023

Verizon

Emissions Analysis for Site: 467929 - Shelton North CT

EBI Consulting was directed to analyze the proposed Verizon facility located at **161 Birdseye Road** in **Shelton, Connecticut** for the purpose of determining whether the emissions from the Proposed Verizon Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu W/cm^2$). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits; therefore, it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general population may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general population would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 600 MHz and 700 MHz frequency bands are approximately 400 $\mu W/cm^2$ and 467 $\mu W/cm^2$, respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 11 GHz frequency bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully

aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed Verizon Wireless antenna facility located at 161 Birdseye Road in Shelton, Connecticut using the equipment information listed below. Modeling of the antennas and associated equipment was completed using RoofMaster™ software, which is a widely-used predictive modeling program that has been developed to predict RF power density values for rooftop and tower telecommunications sites produced by vertical collinear antennas that are typically used in the cellular, PCS, paging and other communications services. Using the computational methods set forth in Federal Communications (FCC) Office of Engineering & Technology (OET) Bulletin 65, "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields" (OET-65), RoofMaster™ calculates predicted power density in a scalable grid based on the contributions of all RF sources characterized in the study scenario. At each grid location, the cumulative power density is expressed as a percentage of the FCC limits. Manufacturer antenna pattern data is utilized in these calculations. RoofMaster™ models consist of the Far Field model as specified in OET-65 and an implementation of the OET-65 Cylindrical Model (Sula9). The models utilize several operational specifications for different types of antennas to produce a plot of spatially-averaged power densities that can be expressed as a percentage of the applicable exposure limit.

Since Verizon is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower. For power density calculations, the broadcast footprint of the AIR6449 or similar SON antenna has been considered. Due to the beamforming nature of these antennas, the actual beam locations vary depending on demand and are narrow in nature. Using the broadcast footprint accounts for the potential location of beams at any given time.

For all calculations, telecommunications equipment was modeled using the following assumptions:

1) 4 LTE channels (700 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

2) 2 CDMA channels (850 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.

3) 4 LTE/5GNR channels (850 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

4) 4 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

5) 4 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

6) 1 nL-Sub6 channel (C-Band Band - 3700 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 200 Watts.

7) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

8) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

9) The antennas used in this modeling are the AMPHENOL SON_LPA-80063-4CF-EDIN 00DT-14DT 850 for the 850 MHz channel(s), the Samsung SON_MT6407 TB -3to10EDT 01.12.22 3700 VZW for the 3700 MHz channel(s), the JMA SON_MX06FRO660-03 02DT-14DT 700 for the 700 MHz / 850 MHz / 1900 MHz / 2100 MHz channel(s), the JMA SON_MX06FRO660-03 02DT-14DT 700 for the 700 MHz / 850 MHz / 1900 MHz / 2100 MHz channel(s) in Sector A, the AMPHENOL SON_LPA-80063-4CF-EDIN 00DT-14DT 850 for the 850 MHz channel(s), the Samsung SON_MT6407 TB -3to10EDT 01.12.22 3700 VZW for the 3700 MHz

channel(s), the JMA SON_MX06FRO660-03 02DT-14DT 700 for the 700 MHz / 850 MHz / 1900 MHz / 2100 MHz channel(s), the JMA SON_MX06FRO660-03 02DT-14DT 700 for the 700 MHz / 850 MHz / 1900 MHz / 2100 MHz channel(s) in Sector B, the AMPHENOL SON_LPA-80063-4CF-EDIN 00DT-14DT 850 for the 850 MHz channel(s), the Samsung SON_MT6407 TB -3to10EDT 01.12.22 3700 VZW for the 3700 MHz channel(s), the JMA SON_MX06FRO660-03 02DT-14DT 700 for the 700 MHz / 850 MHz / 1900 MHz / 2100 MHz channel(s), the JMA SON_MX06FRO660-03 02DT-14DT 700 for the 700 MHz / 850 MHz / 1900 MHz / 2100 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

10) The antenna mounting height centerline of the proposed antennas is 99 feet above ground level (AGL).

11) Emissions values for additional carriers were calculated in Far Field utilizing the antenna models provided in the structural analysis.

12) All calculations were done with respect to uncontrolled / general population threshold limits.

Verizon Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	AMPHENOL SON_LPA-80063-4CF-EDIN 00DT-14DT 850	Make / Model:	AMPHENOL SON_LPA-80063-4CF-EDIN 00DT-14DT 850	Make / Model:	AMPHENOL SON_LPA-80063-4CF-EDIN 00DT-14DT 850
Frequency Bands:	850 MHz	Frequency Bands:	850 MHz	Frequency Bands:	850 MHz
Gain:	13 dBd	Gain:	13 dBd	Gain:	13 dBd
Height (AGL):	99 feet	Height (AGL):	99 feet	Height (AGL):	99 feet
Channel Count:	1	Channel Count:	1	Channel Count:	1
Total TX Power (W):	20.00 Watts	Total TX Power (W):	20.00 Watts	Total TX Power (W):	20.00 Watts
ERP (W):	282.51	ERP (W):	282.51	ERP (W):	282.51
Antenna A1 MPE %:	**0.21%**	Antenna B1 MPE %:	**0.21%**	Antenna C1 MPE %:	**0.21%**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Samsung SON_MT6407 TB - 3to10EDT 01.12.22 3700 VZW	Make / Model:	Samsung SON_MT6407 TB - 3to10EDT 01.12.22 3700 VZW	Make / Model:	Samsung SON_MT6407 TB - 3to10EDT 01.12.22 3700 VZW
Frequency Bands:	3700 MHz	Frequency Bands:	3700 MHz	Frequency Bands:	3700 MHz
Gain:	23.45 dBd	Gain:	23.45 dBd	Gain:	23.45 dBd
Height (AGL):	99 feet	Height (AGL):	99 feet	Height (AGL):	99 feet
Channel Count:	1	Channel Count:	1	Channel Count:	1
Total TX Power (W):	200.00 Watts	Total TX Power (W):	200.00 Watts	Total TX Power (W):	200.00 Watts
ERP (W):	44,261.89	ERP (W):	44,261.89	ERP (W):	44,261.89
Antenna A2 MPE %:	**18.40%**	Antenna B2 MPE %:	**18.40%**	Antenna C2 MPE %:	**18.40%**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	JMA SON_MX06FRO660-03 02DT-14DT 700	Make / Model:	JMA SON_MX06FRO660-03 02DT-14DT 700	Make / Model:	JMA SON_MX06FRO660-03 02DT-14DT 700
Frequency Bands:	700 MHz / 850 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	700 MHz / 850 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	700 MHz / 850 MHz / 1900 MHz / 2100 MHz
Gain:	12.15 dBd / 12.15 dBd / 15.45 dBd / 16.35 dBd	Gain:	12.15 dBd / 12.15 dBd / 15.45 dBd / 16.35 dBd	Gain:	12.15 dBd / 12.15 dBd / 15.45 dBd / 16.35 dBd
Height (AGL):	99 feet	Height (AGL):	99 feet	Height (AGL):	99 feet
Channel Count:	8	Channel Count:	8	Channel Count:	8
Total TX Power (W):	320.00 Watts	Total TX Power (W):	320.00 Watts	Total TX Power (W):	320.00 Watts
ERP (W):	7,917.08	ERP (W):	7,917.08	ERP (W):	7,917.08
Antenna A3 MPE %:	**4.22%**	Antenna B3 MPE %:	**4.22%**	Antenna C3 MPE %:	**4.22%**
Antenna #:	**4**	Antenna #:	**4**	Antenna #:	**4**
Make / Model:	JMA SON_MX06FRO660-03 02DT-14DT 700	Make / Model:	JMA SON_MX06FRO660-03 02DT-14DT 700	Make / Model:	JMA SON_MX06FRO660-03 02DT-14DT 700
Frequency Bands:	700 MHz / 850 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	700 MHz / 850 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	700 MHz / 850 MHz / 1900 MHz / 2100 MHz

Gain:	12.15 dBd / 12.15 dBd / 15.45 dBd / 16.35 dBd	Gain:	12.15 dBd / 12.15 dBd / 15.45 dBd / 16.35 dBd	Gain:	12.15 dBd / 12.15 dBd / 15.45 dBd / 16.35 dBd
Height (AGL):	99 feet	Height (AGL):	99 feet	Height (AGL):	99 feet
Channel Count:	8	Channel Count:	8	Channel Count:	8
Total TX Power (W):	0.00 Watts	Total TX Power (W):	320.00 Watts	Total TX Power (W):	320.00 Watts
ERP (W):	7,917.08	ERP (W):	7,917.08	ERP (W):	7,917.08
Antenna A4 MPE %:	**4.22%**	Antenna B4 MPE %:	**4.22%**	Antenna C4 MPE %:	**4.22%**

Site Composite MPE %	
Carrier	**MPE %**
Verizon (Combined Sectors):	2.56%
T-Mobile	1.25%
AT&T	0.24%
Site Total MPE % :	4.05%

Verizon MPE % Per Sector	
Verizon Sector A Total:	2.46%
Verizon Sector B Total:	2.47%
Verizon Sector C Total:	2.46%
Verizon Total MPE % :	2.56%

Verizon Maximum MPE Power Values (Sector B)

Verizon Frequency Band / Technology (Sector B)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (µW/cm²)	Frequency (MHz)	Allowable MPE (µW/cm²)	Calculated % MPE
Verizon 850 MHz CDMA	1	282.5075089	99	1.17430427	850 MHz CDMA	567.0	0.21%
Verizon 3700 MHz nL-Sub6	1	44261.89419	99	183.9842472	3700 MHz nL-Sub6	1000.0	18.40%
Verizon 700 MHz LTE	2	584.8708698	99	4.862287465	700 MHz LTE	467.0	1.04%
Verizon 850 MHz LTE/5GNR	2	584.8708698	99	4.862287465	850 MHz LTE/5GNR	567.0	0.86%
Verizon 1900 MHz LTE	2	1250.431747	99	10.39538627	1900 MHz LTE	1000.0	1.04%
Verizon 2100 MHz LTE	2	1538.367128	99	12.78911909	2100 MHz LTE	1000.0	1.28%
Verizon 700 MHz LTE	2	584.8708698	99	4.862287465	700 MHz LTE	467.0	1.04%
Verizon 850 MHz LTE/5GNR	2	584.8708698	99	4.862287465	850 MHz LTE/5GNR	567.0	0.86%
Verizon 1900 MHz LTE	2	1250.431747	99	10.39538627	1900 MHz LTE	1000.0	1.04%
Verizon 2100 MHz LTE	2	1538.367128	99	12.78911909	2100 MHz LTE	1000.0	1.28%
Verizon 850 MHz CDMA	1	282.5075089	99	1.17430427	850 MHz CDMA	567.0	0.21%
						Verizon Total:	**2.56%**

• NOTE: Total Verizon MPE values reflect all Verizon antennas as reported by RoofMaster™ calculations.
• NOTE: Totals may vary by approximately 0.01% due to summation of remainders in calculations.

Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general population exposure to RF Emissions.

The anticipated maximum composite contributions from the Verizon facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

Verizon Sector	Power Density Value (%)
Sector A:	2.46%
Sector B:	2.47%
Sector C:	2.46%
Verizon Maximum MPE % (Sector B):	2.47%
Verizon Combined Sectors MPE %:	2.56%
Site Total:	4.05%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **4.05%** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions or documents available on the Connecticut Siting Council website.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government.