Non-Ionizing Radiation Report

Compiled For: Smartlink on behalf of AT&T

Site Name: Chaplin Palmer Road

Site FA: 10042312

Site ID: CTL01153

Palmer Road, Chaplin, CT 06235

Latitude: 41.7845169 Longitude: -72.1357239

Structure Type: Monopole

Report Date: October 8, 2019

Status: AT&T will be compliant with FCC rules on RF Exposure with the signage recommendation in section 4 of this report.

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1. Executive Summary:

Smartlink on behalf of AT&T has contracted Infinigy Solutions, LLC to determine whether the site Norfolk Ashpohtag Road located at Palmer Road in Chaplin, CT Will Be Compliant with all Federal Communications Commission (FCC) rules and regulations for radio frequency (RF) exposure as indicated in **47CFR§1.1310**.

The report incorporates a theoretical RF field analysis in accordance with the FCC Rules and Regulations for all individuals classified as "Occupational or Controlled" and "General Public or Uncontrolled" (see Appendix A and B).

This document and the conclusions herein are based on information provided by Smartlink on behalf of AT&T.

As a result of the analysis, **AT&T Will Be Compliant with FCC rules with the installation of signage recommended in section 4.**

Engineering assumptions were made regarding the collation operator(s). The assumptions were made based upon typical deployment configurations and practices of the operator(s).

All Carriers, All Bands Cumulative Exposure %		
Uncontrolled / General Population	Exposure values at the site (mW/cm^2)	0.0257
	% Exposure	3.68%
Controlled / Occupational	Exposure values at the site (mW/cm^2)	0.0257
	% Exposure	0.77%

2. Site Summary:

Site Information	
Site Name: Chaplin Palmer Road	
Site Address: Palmer Road, Chaplin, CT 06235	
Site Type: Monopole	
Compliance Status	Will Be Compliant
Mitigation Required	No
Signage Required	Yes
Barriers Required	No
Access Locked	No
Area Controlled or Uncontrolled	Uncontrolled

3. Site Compliance

This report also incorporates overview of the site information:

- Antenna Inventory Table
- Calculation Tables showing exposure for each carrier transmit frequency
- Total exposure for all carriers existing and proposed at ground level considering the centerline of all antennas and horizontal distance from the tower.
- Maximum Effective Radiated Power Assumed as Worst Case for Calculations used in this study
- Calculations based on flat ground around base of the structure

4. Site Compliance Recommendations

Infinigy recommends the following upon the installation of antennas at the site:

Base of tower

Caution 2 sign.

Note: The above signage recommendation is moot if there is an existing caution 2 sign at the base of the tower.

5. Antenna Inventory Table

Ant ID	Sector	Operator	Antenna manufacturer	Antenna Model	Operating Frequency	Rad Ctr (Ft)	Total ERP Power (Watts)
1a	Alpha	AT&T	Powerwave	7770	850	137	1302
2a	Alpha	AT&T	CCI	HPA-65R-BUU-H6	700	137	2951
2b	Alpha	AT&T	CCI	HPA-65R-BUU-H6	1900	137	3837
3a	Alpha	AT&T	CCI	DMP65R-BU6DA	700	137	1476
3b	Alpha	AT&T	CCI	DMP65R-BU6DA	850	137	1000
3c	Alpha	AT&T	CCI	DMP65R-BU6DA	2100	137	3837
3d	Alpha	AT&T	CCI	DMP65R-BU6DA	850	137	1000
4a	Beta	AT&T	Powerwave	7770	850	137	1302
4b	Beta	AT&T	Powerwave	7770	1900	137	1717
5a	Beta	AT&T	CCI	HPA-65R-BUU-H6	700	137	2951
5b	Beta	AT&T	CCI	HPA-65R-BUU-H6	1900	137	3837
6a	Beta	AT&T	CCI	DMP65R-BU6DA	700	137	1476
6b	Beta	AT&T	CCI	DMP65R-BU6DA	850	137	1000
6c	Beta	AT&T	CCI	DMP65R-BU6DA	2100	137	3837
6d	Beta	AT&T	CCI	DMP65R-BU6DA	850	137	1000
7a	Gamma	AT&T	Powerwave	7770	850	137	1302
7b	Gamma	AT&T	Powerwave	7770	1900	137	1717
8a	Gamma	AT&T	CCI	HPA-65R-BUU-H6	700	137	2951
8b	Gamma	AT&T	CCI	HPA-65R-BUU-H6	1900	137	3837
9a	Gamma	AT&T	CCI	DMP65R-BU6DA	700	137	1476
9b	Gamma	AT&T	CCI	DMP65R-BU6DA	850	137	1000
9c	Gamma	AT&T	CCI	DMP65R-BU6DA	2100	137	3837
9d	Gamma	AT&T	CCI	DMP65R-BU6DA	850	137	1000
10	Alpha	Verizon Wireless	Antel	LPA-80080/6CF	850	127	1532
11	Alpha	Verizon Wireless	Antel	LPA-80080/6CF	850	127	1532

Ant ID	Sector	Operator	Antenna manufacturer	Antenna Model	Operating Frequency	Rad Ctr (Ft)	Total ERP Power (Watts)
12a	Alpha	Verizon Wireless	Commscope	BXA-171085-12CF	1900	127	3308
12b	Alpha	Verizon Wireless	Commscope	BXA-171085-12CF	2100	127	3208
13	Alpha	Verizon Wireless	Antel	BXA 63/6CF	700	127	1797
12	Beta	Verizon Wireless	Antel	LPA-80080/6CF	850	127	1532
13	Beta	Verizon Wireless	Antel	LPA-80080/6CF	850	127	1532
14a	Beta	Verizon Wireless	Commscope	BXA-171085-12CF	1900	127	3308
14b	Beta	Verizon Wireless	Commscope	BXA-171085-12CF	2100	127	3208
15	Beta	Verizon Wireless	Antel	BXA 63/6CF	700	127	1797
16	Gamma	Verizon Wireless	Antel	LPA-80080/6CF	850	127	1532
17	Gamma	Verizon Wireless	Antel	LPA-80080/6CF	850	127	1532
18a	Gamma	Verizon Wireless	Commscope	BXA-171085-12CF	1900	127	3308
18b	Gamma	Verizon Wireless	Commscope	BXA-171085-12CF	2100	127	3208
19	Gamma	Verizon Wireless	Antel	BXA 63/6CF	700	127	1797
20	Alpha	Sprint	RFS	APX16DW-16DWS	1900	145.5	2185
21a	Alpha	Sprint	Commscope	NNVV-65B-R4	850	145.5	1054
21b	Alpha	Sprint	RFS	NNVV-65B-R4	2500	145.5	1789
22	Gamma	Sprint	RFS	APX16DW-16DWS	1900	145.5	2185
23a	Gamma	Sprint	Commscope	NNVV-65B-R4	850	145.5	1054
23b	Gamma	Sprint	RFS	NNVV-65B-R4	2500	145.5	1789

6. RF Guidelines

To ensure safety of company workers, the following points need to be taken into consideration and implemented at wireless sites in accordance with the Carriers policies:

a) Worksite: Any employee at the site should avoid working directly in front of the antenna or in areas predicted to exceed general population exposure limits by 100%. Workers should insist that the transmitters be switched off during the work period.

b) RF Safety Training and Awareness: All employees working in areas exceeding the general population limits should have a basic awareness of RF safety measures. Videos, classroom lectures and online courses are all appropriate training methods on these topics.

c) Site Access: Restricting access to transmitting antenna locations is one of the most important elements of RF safety. This can be done with:
   - Locked doors/gates/ladder access
   - Alarmed doors
   - Restrictive barriers

d) Three-foot Buffer: There is an inverse relationship between the strength of the field and the distance from the antenna. The RF field diminishes with distance from the antenna. Workers should maintain a three-foot distance from the antennas.

e) Antennas: Workers should always assume that the antenna is transmitting and should never stop right in front of the antenna. If someone must pass by an antenna, he/she should move quickly, thus reducing RF exposure.

Attachment 1: AT&T Exposure Analysis

AT&T 700 MHz LTE		
Uncontrolled / General Population	FCC's exposure limits (mW/cm^2)	**0.5**
	Exposure values at the site (mW/cm^2)	**0.0043**
	% Exposure	**0.86%**
Controlled / Occupational	FCC's Exposure limits(mW/cm^2)	**2.3**
	Exposure values at the site (mW/cm^2)	**0.0043**
	% Exposure	**0.19%**

AT&T 850 MHz LTE		
Uncontrolled / General Population	FCC's exposure limits (mW/cm^2)	**0.6**
	Exposure values at the site (mW/cm^2)	**0.0010**
	% Exposure	**0.16%**
Controlled / Occupational	FCC's Exposure limits(mW/cm^2)	**2.8**
	Exposure values at the site (mW/cm^2)	**0.0010**
	% Exposure	**0.03%**

AT&T 850 MHz UMTS		
Uncontrolled / General Population	FCC's exposure limits (mW/cm^2)	**0.6**
	Exposure values at the site (mW/cm^2)	**0.0013**
	% Exposure	**0.21%**
Controlled / Occupational	FCC's Exposure limits(mW/cm^2)	**2.8**
	Exposure values at the site (mW/cm^2)	**0.0013**
	% Exposure	**0.05%**

AT&T 850 MHz 5G		
Uncontrolled / General Population	FCC's exposure limits (mW/cm²)	**0.6**
	Exposure values at the site (mW/cm²)	**0.0010**
	% Exposure	**0.16%**
Controlled / Occupational	FCC's Exposure limits(mW/cm²)	**2.8**
	Exposure values at the site (mW/cm²)	**0.0010**
	% Exposure	**0.03%**

AT&T 1900 MHz LTE		
Uncontrolled / General Population	FCC's exposure limits (mW/cm²)	**1.0**
	Exposure values at the site (mW/cm²)	**0.0036**
	% Exposure	**0.36%**
Controlled / Occupational	FCC's Exposure limits(mW/cm²)	**5.0**
	Exposure values at the site (mW/cm²)	**0.0036**
	% Exposure	**0.07%**

AT&T 2100 MHz LTE		
Uncontrolled / General Population	FCC's exposure limits (mW/cm²)	**1.0**
	Exposure values at the site (mW/cm²)	**0.0037**
	% Exposure	**0.37%**
Controlled / Occupational	FCC's Exposure limits(mW/cm²)	**5.0**
	Exposure values at the site (mW/cm²)	**0.0037**
	% Exposure	**0.07%**

Attachment 2: Verizon Wireless Exposure Analysis

Verizon Wireless 700 MHz LTE		
Uncontrolled / General Population	FCC's exposure limits (mW/cm^2)	**0.5**
	Exposure values at the site (mW/cm^2)	**0.0008**
	% Exposure	**0.16%**
Controlled / Occupational	FCC's Exposure limits(mW/cm^2)	**2.3**
	Exposure values at the site (mW/cm^2)	**0.0008**
	% Exposure	**0.03%**

Verizon Wireless 850 MHz CDMA		
Uncontrolled / General Population	FCC's exposure limits (mW/cm^2)	**0.6**
	Exposure values at the site (mW/cm^2)	**0.0011**
	% Exposure	**0.18%**
Controlled / Occupational	FCC's Exposure limits(mW/cm^2)	**2.8**
	Exposure values at the site (mW/cm^2)	**0.0011**
	% Exposure	**0.04%**

Verizon Wireless 850 MHz LTE		
Uncontrolled / General Population	FCC's exposure limits (mW/cm^2)	**0.6**
	Exposure values at the site (mW/cm^2)	**0.0011**
	% Exposure	**0.18%**
Controlled / Occupational	FCC's Exposure limits(mW/cm^2)	**2.8**
	Exposure values at the site (mW/cm^2)	**0.0011**
	% Exposure	**0.04%**

Verizon Wireless 1900 MHz LTE		
Uncontrolled / General Population	FCC's exposure limits (mW/cm^2)	**1.0**
	Exposure values at the site (mW/cm^2)	**0.0015**
	% Exposure	**0.15%**
Controlled / Occupational	FCC's Exposure limits(mW/cm^2)	**5.0**
	Exposure values at the site (mW/cm^2)	**0.0015**
	% Exposure	**0.03%**

Verizon Wireless 2100 MHz LTE		
Uncontrolled / General Population	FCC's exposure limits (mW/cm^2)	**1.0**
	Exposure values at the site (mW/cm^2)	**0.0016**
	% Exposure	**0.16%**
Controlled / Occupational	FCC's Exposure limits(mW/cm^2)	**5.0**
	Exposure values at the site (mW/cm^2)	**0.0016**
	% Exposure	**0.03%**

Attachment 3: T-Mobile Exposure Analysis

T-Mobile 600 MHz LTE		
Uncontrolled / General Population	FCC's exposure limits (mW/cm²)	**0.4**
	Exposure values at the site (mW/cm²)	**0.001704**
	% Exposure	**0.43%**
Controlled / Occupational	FCC's Exposure limits(mW/cm²)	**2.0**
	Exposure values at the site (mW/cm²)	**0.001704**
	% Exposure	**0.0852%**

T-Mobile 700 MHz LTE		
Uncontrolled / General Population	FCC's exposure limits (mW/cm²)	**0.5**
	Exposure values at the site (mW/cm²)	**0.001835**
	% Exposure	**0.37%**
Controlled / Occupational	FCC's Exposure limits(mW/cm²)	**2.3**
	Exposure values at the site (mW/cm²)	**0.001835**
	% Exposure	**0.0798%**

T-Mobile 1900 MHz LTE		
Uncontrolled / General Population	FCC's exposure limits (mW/cm²)	**1.0**
	Exposure values at the site (mW/cm²)	**0.002312**
	% Exposure	**0.23%**
Controlled / Occupational	FCC's Exposure limits(mW/cm²)	**5.0**
	Exposure values at the site (mW/cm²)	**0.002312**
	% Exposure	**0.0462%**

T-Mobile 2100 MHz LTE		
Uncontrolled / General Population	FCC's exposure limits (mW/cm^2)	**1.0**
	Exposure values at the site (mW/cm^2)	**0.002640**
	% Exposure	**0.26%**
Controlled / Occupational	FCC's Exposure limits(mW/cm^2)	**5.0**
	Exposure values at the site (mW/cm^2)	**0.002640**
	% Exposure	**0.0528%**

Attachment 4: Sprint Exposure Analysis

Sprint 862 MHz LTE		
Uncontrolled / General Population	FCC's exposure limits (mW/cm²)	**0.6**
	Exposure values at the site (mW/cm²)	**0.0009**
	% Exposure	**0.15%**
Controlled / Occupational	FCC's Exposure limits(mW/cm²)	**2.8**
	Exposure values at the site (mW/cm²)	**0.0009**
	% Exposure	**0.0313%**

Sprint 1900 MHz LTE		
Uncontrolled / General Population	FCC's exposure limits (mW/cm²)	**1.0**
	Exposure values at the site (mW/cm²)	**0.0018**
	% Exposure	**0.18%**
Controlled / Occupational	FCC's Exposure limits(mW/cm²)	**5.0**
	Exposure values at the site (mW/cm²)	**0.0018**
	% Exposure	**0.0359%**

Sprint 2500 MHz LTE		
Uncontrolled / General Population	FCC's exposure limits (mW/cm²)	**1.0**
	Exposure values at the site (mW/cm²)	**0.0015**
	% Exposure	**0.15%**
Controlled / Occupational	FCC's Exposure limits(mW/cm²)	**5.0**
	Exposure values at the site (mW/cm²)	**0.0015**
	% Exposure	**0.0296%**

Attachment 5: Combined Exposure Analysis for each Carrier

AT&T All Bands		
Uncontrolled / General Population	Exposure values at the site (mW/cm^2)	0.0148
	% Exposure	2.12%
Controlled / Occupational	Exposure values at the site (mW/cm^2)	0.0148
	% Exposure	0.45%

Verizon Wireless All Bands		
Uncontrolled / General Population	Exposure values at the site (mW/cm^2)	0.0051
	% Exposure	0.66%
Controlled / Occupational	Exposure values at the site (mW/cm^2)	0.0051
	% Exposure	0.14%

T-Mobile All Bands		
Uncontrolled / General Population	Exposure values at the site (mW/cm^2)	0.001704
	% Exposure	0.43%
Controlled / Occupational	Exposure values at the site (mW/cm^2)	0.001704
	% Exposure	0.09%

Sprint All Bands		
Uncontrolled / General Population	Exposure values at the site (mW/cm^2)	0.0042
	% Exposure	0.47%
Controlled / Occupational	Exposure values at the site (mW/cm^2)	0.0042
	% Exposure	0.10%

7. Appendix A: FCC Guidelines

FCC Policies

The Federal Communications Commission (FCC) in 1996 implemented regulations and policies for analysis of RF propagation to evaluate RF emissions. All the analysis and results of this report are compared with FCC's (Federal Communications Commission) rules to determine whether a site is compliant for Occupational/Controlled or General Public/Uncontrolled exposure. All the analysis of RF propagation is done in terms of a percentage. The limits primarily indicate the power density and are generally expressed in terms of milliwatts per centimeter square, mW/cm^2.

FCC guidelines incorporate two separate tiers of exposure limits that are dependent on the scenario/ situation in which that exposure takes place or the status of the individuals who are subjected to that exposure. The decision as to which tier is applied to a scenario is based on the following definitions:

Occupational / Controlled

These limits apply in situations when someone is exposed to RF energy through his/her occupation, is fully aware of the harmful effects of the RF exposure and has an ability to exercise control over this exposure. Occupational / controlled exposure limits also apply when 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. limits for Occupational/Controlled exposure can be found on Table 1(A).

General Population / Uncontrolled

These limits apply to situations in which the general public may be exposed or in which persons who are exposed because of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure to RF. Therefore, members of the general public would always be considered under this category, for example, in the case of a telecommunications tower that exposes people in a nearby residential area. Exposure limits for General Population/Uncontrolled can be found on Table 1(B).

Table 1. LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

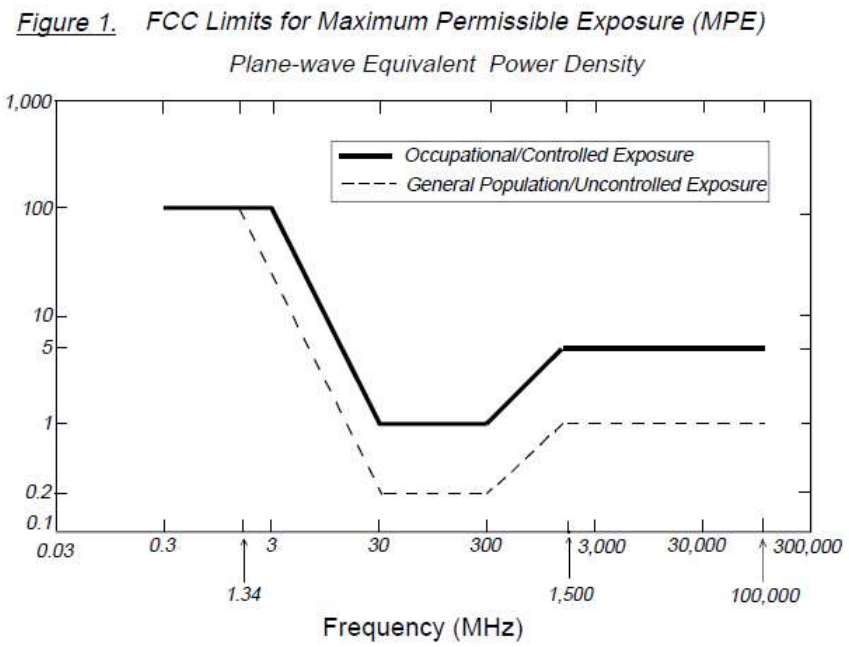
(A) Limits for Occupational/Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (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 Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (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



OSHA Statement:

The objective of the OSHA Act is to ensure the safety and health of the working men and women by enforcing certain standards. The act also assists and encourages the states in their efforts to ensure safe and healthy working conditions through means of research, information, education and training in the field of occupational safety and health and for other purposes.

According to OSHA Act section 5, important duties to be considered are:

(a) Each employer

1) Shall furnish to each of his employees' employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious harm to his employees
2) Shall comply with occupational safety and health standards promulgated under this act.

(b) Each employee shall comply with occupational safety and health standards and all rules, regulations, and orders issued pursuant to this Act which are applicable to his own actions and conduct.

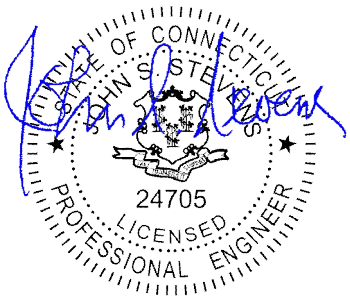
8. Appendix B: Preparer Certification

I, Tim Harris, preparer of this report, certify that I am fully trained and aware of the rules and regulations of both the Federal Communications Commission and the Occupational Safety and Heath Administration regarding Human Exposure to Radio Frequency Radiation. In addition, I have been trained in 1) RF safety and 2) RF modeling using RoofView modeling software.

I certify that the information contained in this report is true and correct to the best of my knowledge.

Timothy A. Harris *10/8/2019*

Signature Date



10/08/2019