INFINIGY

THE SOLUTIONS ARE ENDLESS

Non-Ionizing Radiation Report

Compiled For: Smartlink on behalf of AT&T

Site Name: Harwinton

Site FA: 10035016

Site ID: CTL01057

159 Weingert Road, Harwinton, CT 06791

Latitude: 41.7877419 Longitude: -73.0925269

Structure Type: Monopole

Report Date: December 9, 2019

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

Table of Contents

1. Executive Summary: 3
2. Site Summary: 4
3. Site Compliance 4
4. Site Compliance Recommendations 5
5. Antenna Inventory Table 6
6. RF Guidelines 9
Attachment 1: AT&T Exposure Analysis 10
Attachment 2: Verizon Wireless Exposure Analysis 12
Attachment 3: T-Mobile Exposure Analysis 14
Attachment 4: Sprint Exposure Analysis 15
Attachment 4: Combined Exposure Analysis for each Carrier 16
7. Appendix A: FCC Guidelines 18
FCC Policies 18
Occupational / Controlled 18
General Population / Uncontrolled 18
8. Appendix B: Preparer Certification 21

1. Executive Summary:

Smartlink on behalf of AT&T has contracted Infinigy Solutions, LLC to determine whether the site Harwinton located at 159 Weingert Road in Norwich, 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)	0.0071
	% Exposure	1.04%
Controlled / Occupational	Exposure values at the site (mW/cm^2)	0.0071
	% Exposure	0.22%

2. Site Summary:

Site Information	
Site Name: Harwinton	
Site Address: 159 Weingert Road, Harwinton, CT 06791	
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)
1	Alpha	AT&T	Powerwave	7770	850	185	282
2a	Alpha	AT&T	CCI	DMP65R-BU6DA	700	185	1476
2b	Alpha	AT&T	CCI	DMP65R-BU6DA	850	185	1000
2c	Alpha	AT&T	CCI	DMP65R-BU6DA	1900	185	3837
2d	Alpha	AT&T	CCI	DMP65R-BU6DA	2100	185	1000
3a	Alpha	AT&T	Quintel	QS66512-2	850	185	2951
3b	Alpha	AT&T	Quintel	QS66512-2	850	185	1285
4	Alpha	AT&T	Powerwave	7770	850	185	3664
5	Beta	AT&T	Powerwave	7770	850	185	282
6a	Beta	AT&T	CCI	DMP65R-BU6DA	700	185	1476
6b	Beta	AT&T	CCI	DMP65R-BU6DA	850	185	1000
6c	Beta	AT&T	CCI	DMP65R-BU6DA	1900	185	3837
6d	Beta	AT&T	CCI	DMP65R-BU6DA	2100	185	1000
7a	Beta	AT&T	Quintel	QS66512-2	850	185	2951
7b	Beta	AT&T	Quintel	QS66512-2	850	185	1285
8	Beta	AT&T	Powerwave	7770	850	185	3664
9	Gamma	AT&T	Powerwave	7770	850	185	282
10a	Gamma	AT&T	CCI	DMP65R-BU6DA	700	185	1476
10b	Gamma	AT&T	CCI	DMP65R-BU6DA	850	185	1000
10c	Gamma	AT&T	CCI	DMP65R-BU6DA	1900	185	3837
10d	Gamma	AT&T	CCI	DMP65R-BU6DA	2100	185	1000
11a	Gamma	AT&T	Quintel	QS66512-2	850	185	2951
11b	Gamma	AT&T	Quintel	QS66512-2	850	185	1285
12	Gamma	AT&T	Powerwave	7770	850	185	3664
14a	Alpha	Verizon Wireless	Commscope	JAHH-65C-3B	700	175	1499

Ant ID	Sector	Operator	Antenna manufacturer	Antenna Model	Operating Frequency	Rad Ctr (Ft)	Total ERP Power (Watts)
14b	Alpha	Verizon Wireless	Commscope	JAHH-65C-3B	1900	175	2727
14c	Alpha	Verizon Wireless	Commscope	JAHH-65C-3B	2100	175	2734
15	Alpha	Verizon Wireless	Commscope	LPA-80080/6CF	850	175	1658
16	Beta	Verizon Wireless	Commscope	LPA-80080/6CF	850	175	1658
17a	Beta	Verizon Wireless	Commscope	JAHH-65C-3B	700	175	1499
17b	Beta	Verizon Wireless	Commscope	JAHH-65C-3B	1900	175	2727
17c	Beta	Verizon Wireless	Commscope	JAHH-65C-3B	2100	175	2734
18	Beta	Verizon Wireless	Commscope	LPA-80080/6CF	850	175	1658
18	Gamma	Verizon Wireless	Commscope	LPA-80080/6CF	850	175	1658
20a	Gamma	Verizon Wireless	Commscope	JAHH-65C-3B	700	175	1499
20b	Gamma	Verizon Wireless	Commscope	JAHH-65C-3B	1900	175	2727
20c	Gamma	Verizon Wireless	Commscope	JAHH-65C-3B	2100	175	2734
21	Gamma	Verizon Wireless	Commscope	LPA-80080/6CF	850	175	1658
22	Alpha	Metro PCS (T-Mobile)	Commscope	LNX-6515DS-VTM	700	163	1976
23	Alpha	Metro PCS (T-Mobile)	Commscope	Air B2P/B4A	1900	163	2397
24	Alpha	Metro PCS (T-Mobile)	Commscope	Air B2P/B4A	2100	163	2348
25	Beta	Metro PCS (T-Mobile)	Commscope	LNX-6515DS-VTM	700	163	1976
26	Beta	Metro PCS (T-Mobile)	Commscope	Air B2P/B4A	1900	163	2397
27	Beta	Metro PCS (T-Mobile)	Commscope	Air B2P/B4A	2100	163	2348
28	Gamma	Metro PCS (T-Mobile)	Commscope	LNX-6515DS-VTM	700	163	1976
29	Gamma	Metro PCS (T-Mobile)	Commscope	Air B2P/B4A	1900	163	2397

Ant ID	Sector	Operator	Antenna manufacturer	Antenna Model	Operating Frequency	Rad Ctr (Ft)	Total ERP Power (Watts)
30	Gamma	Metro PCS (T-Mobile)	Commscope	Air B2P/B4A	2100	163	2348
31	Alpha	Sprint	KMW	HB-X-AW-17-65	2100	145	2074
32	Beta	Sprint	KMW	HB-X-AW-17-65	2100	145	2074
33	Gamma	Sprint	KMW	HB-X-AW-17-65	2100	145	2074

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)	**0.0005**
	% Exposure	**0.10%**
Controlled / Occupational	FCC's Exposure limits(mW/cm^2)	**2.3**
	Exposure values at the site (mW/cm^2)	**0.0005**
	% Exposure	**0.02%**

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)	**0.0019**
	% Exposure	**0.31%**
Controlled / Occupational	FCC's Exposure limits(mW/cm^2)	**2.8**
	Exposure values at the site (mW/cm^2)	**0.0019**
	% Exposure	**0.07%**

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)	**0.0003**
	% Exposure	**0.05%**
Controlled / Occupational	FCC's Exposure limits(mW/cm^2)	**2.8**
	Exposure values at the site (mW/cm^2)	**0.0003**
	% Exposure	**0.01%**

AT&T 850 MHz 5G		
Uncontrolled / General Population	FCC's exposure limits (mW/cm^2)	**0.6**
	Exposure values at the site (mW/cm^2)	**0.0021**
	% Exposure	**0.34%**
Controlled / Occupational	FCC's Exposure limits(mW/cm^2)	**2.8**
	Exposure values at the site (mW/cm^2)	**0.0021**
	% Exposure	**0.07%**

AT&T 1900 MHz LTE		
Uncontrolled / General Population	FCC's exposure limits (mW/cm^2)	**1.0**
	Exposure values at the site (mW/cm^2)	**0.0019**
	% Exposure	**0.19%**
Controlled / Occupational	FCC's Exposure limits(mW/cm^2)	**5.0**
	Exposure values at the site (mW/cm^2)	**0.0019**
	% Exposure	**0.04%**

AT&T 2100 MHz LTE		
Uncontrolled / General Population	FCC's exposure limits (mW/cm^2)	**1.0**
	Exposure values at the site (mW/cm^2)	**0.0005**
	% Exposure	**0.05%**
Controlled / Occupational	FCC's Exposure limits(mW/cm^2)	**5.0**
	Exposure values at the site (mW/cm^2)	**0.0005**
	% Exposure	**0.01%**

Attachment 2: Verizon Wireless Exposure Analysis

Verizon Wireless 700 MHz LTE		
Uncontrolled / General Population	FCC's exposure limits (mW/cm²)	**0.5**
	Exposure values at the site (mW/cm²)	**0.0008**
	% Exposure	**0.16%**
Controlled / Occupational	FCC's Exposure limits(mW/cm²)	**2.8**
	Exposure values at the site (mW/cm²)	**0.0008**
	% Exposure	**0.0291%**

Verizon Wireless 850 MHz CDMA		
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	**0.0321%**

Verizon Wireless 850 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	**0.0321%**

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	**0.0296%**

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)	**0.001484**
	% Exposure	**0.15%**
Controlled / Occupational	FCC's Exposure limits(mW/cm^2)	**5.0**
	Exposure values at the site (mW/cm^2)	**0.001484**
	% Exposure	**0.0297%**

Attachment 3: T-Mobile Exposure Analysis

T-Mobile 700 MHz LTE		
Uncontrolled / General Population	FCC's exposure limits (mW/cm^2)	**1.0**
	Exposure values at the site (mW/cm^2)	**0.0012**
	% Exposure	**0.12%**
Controlled / Occupational	FCC's Exposure limits(mW/cm^2)	**5.0**
	Exposure values at the site (mW/cm^2)	**0.0012**
	% Exposure	**0.02%**

T-Mobile 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%**

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)	**0.0015**
	% 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%**

Attachment 4: Sprint Exposure Analysis

Sprint 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 4: Combined Exposure Analysis for each Carrier

AT&T All Bands		
Uncontrolled / General Population	Exposure values at the site (mW/cm^2)	0.0079
	% Exposure	1.25%
Controlled / Occupational	Exposure values at the site (mW/cm^2)	0.0079
	% Exposure	0.27%

Verizon Wireless All Bands		
Uncontrolled / General Population	Exposure values at the site (mW/cm^2)	0.0041
	% Exposure	0.61%
Controlled / Occupational	Exposure values at the site (mW/cm^2)	0.0047
	% Exposure	0.12%

T-Mobile All Bands		
Uncontrolled / General Population	Exposure values at the site (mW/cm^2)	0.0042
	% Exposure	0.12%
Controlled / Occupational	Exposure values at the site (mW/cm^2)	0.0042
	% Exposure	0.02%

Sprint All Bands		
Uncontrolled / General Population	Exposure values at the site (mW/cm^2)	0.0016
	% Exposure	0.16%
Controlled / Occupational	Exposure values at the site (mW/cm^2)	0.0016
	% Exposure	0.03%

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)

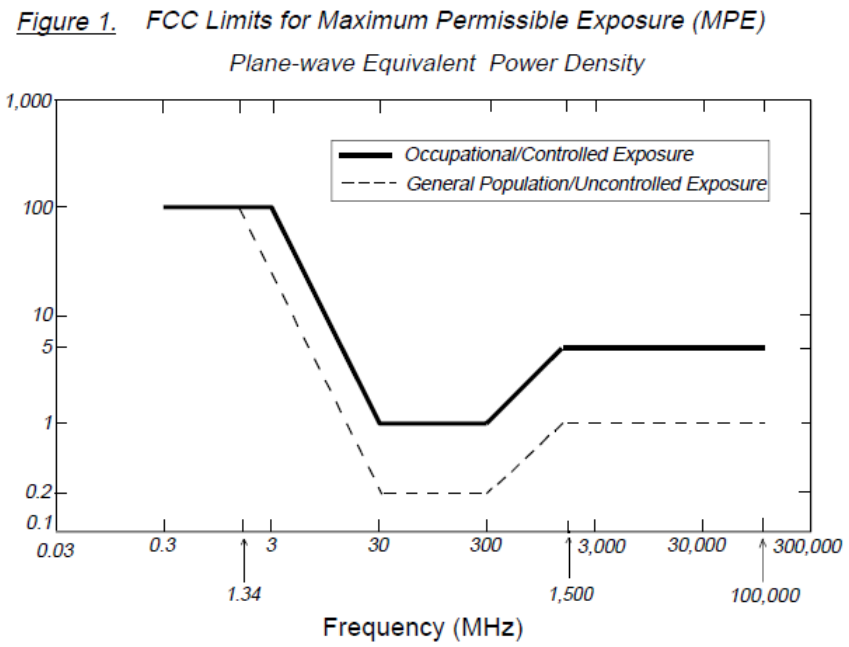
(A) Limits for Occupational/Controlled Exposure

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 *12/9/2019*

Signature Date