

EME or

NIETK

Report

Radio Frequency – Electromagnetic Energy (RF-EME) Compliance Report

Site No. AL43XC750

NY13/366 CAC

1397 Dryden Road

Ithaca, New York 14850

Delaware County

42.468937; -76.402941 NAD83

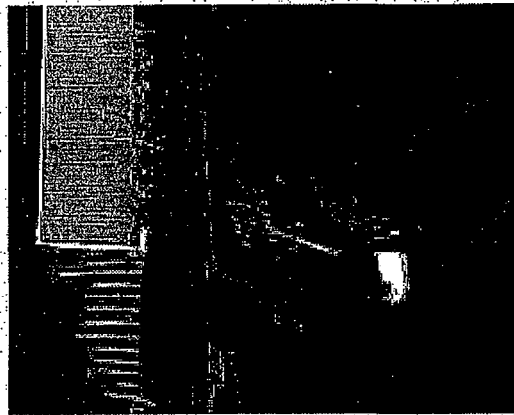
Monopole

Tompkins



EBI Project No. 6218005605

August 17, 2018



Prepared for:

Sprint Nextel

9 Crosby Drive

Bedford, MA 01730

Prepared by:

 **EBI Consulting**
environmental | engineering | due diligence

EXECUTIVE SUMMARY

Purpose of Report

EnviroBusiness Inc. (dba EBI Consulting) has been contracted by Sprint to conduct radio frequency electromagnetic (RF-EME) modeling for Sprint Site AL43XC750 located at 1397 Dryden Road in Ithaca, New York to determine RF-EME exposure levels from proposed Sprint wireless communications equipment at this site. As described in greater detail in Appendix B of this report, the Federal Communications Commission (FCC) has developed Maximum Permissible Exposure (MPE) Limits for general public exposures and occupational exposures. This report summarizes the results of RF-EME modeling in relation to relevant FCC RF-EME compliance standards for limiting human exposure to RF-EME fields.

This report contains a detailed summary of the RF EME analysis for the site.

This document addresses the compliance of Sprint’s proposed transmitting facilities independently and in relation to all existing collocated facilities at the site.

Modeling results included in this report are based on drawings dated June 28, 2018 as provided to EBI Consulting. Subsequent changes to the drawings or site design may yield changes in the MPE levels or FCC Compliance recommendations.

Maximum Permissible Exposure (MPE) Summary			
Location	% of FCC General Public/Uncontrolled Exposure Limit	% of FCC Occupational/Controlled Exposure Limit	Power Density (mW/cm²)
All Carrier Equipment			
Equipment Shelter Roof	6.20	1.24	0.03307
Ground	5.80	1.16	0.03093
Sprint Equipment			
Equipment Shelter Roof	5.60	1.12	0.02987

Statement of Compliance

Based on worst-case predictive modeling, there are no modeled exposures on any accessible rooftop or ground-level walking/working surface related to Sprint’s proposed equipment in the area that exceed the FCC’s occupational and/or general public exposure limits at this site. As such, the proposed Sprint project is in compliance with FCC rules and regulations.

Signage is recommended at the site as presented in Section 9.0 and Appendix A. Posting of the signage brings the site into compliance with FCC rules and regulations.

1.0 LOCATION OF ALL EXISTING ANTENNAS AND FACILITIES AND EXISTING RF LEVELS

Sprint proposes the replacement of three (3) and installation of three (3) wireless telecommunication antennas on a monopole in Ithaca, New York. The proposed modification will result in a total of six (6) Sprint antennas at the site. There are three sectors (A, B and C) proposed at the site, with two (2) proposed antennas per sector.

Based on drawings and aerial photography review, Verizon wireless antennas are also present on the monopole. These antennas were included in the modeling analysis.

Additionally, information regarding other carrier antennas was supplemented by a Structural Analysis report provided by Sprint.

2.0 LOCATION OF ALL APPROVED (BUT NOT INSTALLED) ANTENNAS AND FACILITIES AND EXPECTED RF LEVELS FROM THE APPROVED FACILITIES

There are no antennas or facilities that are approved and not installed based on information provided to EBI and Sprint at the time of this report.

3.0 NUMBER AND TYPES OF WIRELESS TELECOMMUNICATION SITES (WTS) WITHIN 100 FEET OF THE PROPOSED SITE

There are no other Wireless Telecommunication Service (WTS) sites observed within 100 feet of the proposed site.

4.0 LOCATION AND NUMBER OF THE SPRINT ANTENNAS AND BACK-UP FACILITIES PER STRUCTURE AND NUMBER AND LOCATION OF OTHER TELECOMMUNICATION FACILITIES ON THE PROPERTY

Sprint proposes the replacement of three (3) and installation of three (3) wireless telecommunication antennas on a monopole in Ithaca, New York. The proposed modification will result in a total of six (6) Sprint antennas at the site. There are three sectors (A, B and C) proposed at the site, with two (2) proposed antennas per sector. In each sector, there is proposed to be one antenna transmitting in the 800 MHz and the 1900 MHz and one antenna transmitting in the 2500 MHz frequency range. The Sector A antennas will be oriented 60° from true north. The Sector B antennas will be oriented 270° from true north. The Sector C antennas will be oriented 350° from true north. The bottoms of the Sector A and C 2500 and 800/1900 antennas will be 77.7 and 76.6 feet, respectively, above a ground level. The bottoms of the Sector B 2500 and 800/1900 antennas will be 67.7 and 66.6 feet, respectively, above a an equipment shelter.

Based on drawings and aerial photography review, Verizon wireless antennas are also present on the monopole. These antennas were included in the modeling analysis.

Additionally, information regarding other carrier antennas was supplemented by a Structural Analysis report provided by Sprint.

5.0 POWER RATING FOR ALL EXISTING AND PROPOSED BACKUP EQUIPMENT SUBJECT TO THE APPLICATION

The operating power of each frequency, for modeling purposes, was assumed to be the following:

Sprint Operating Powers Per Sector		
Frequency (MHz)	Power (Watts)	# of Transmitters
800	50	4
1900	45	4
2500	20	8

Additional transmitter information used in the modeling of Sprint antennas is summarized in the RoofView® export file presented in Appendix D.

6.0 TOTAL NUMBER OF WATTS PER INSTALLATION AND THE TOTAL NUMBER OF WATTS FOR ALL INSTALLATIONS ON THE STRUCTURE

The Effective Radiated Power (ERP) for each carrier and frequency is summarized below:

Effective Radiated Power (ERP) per Frequency	
Frequency (MHz)	ERP (Watts)
Sprint 800	11,726
Sprint 1900	17,116
Sprint 2500	15,749
Other Carriers (Total)*	16,261

* Other carrier ERPs were not provided. The ERP calculation is based on worst-case assumptions of other carrier operating powers.

7.0 PREFERRED METHOD OF ATTACHMENT OF PROPOSED ANTENNA WITH PLOT OR ROOF PLAN INCLUDING: DIRECTIONALITY OF ANTENNAS, HEIGHT OF ANTENNAS ABOVE NEAREST WALKING SURFACE, DISCUSS NEARBY INHABITED BUILDINGS

Based on the information provided to EBI, the proposed antennas are to be mounted on the monopole and operating in the directions, frequencies, and heights mentioned in section 4.0 above. There is a residential building 200 feet to the north of the proposed site. There are woods to the north, east, and south of the site with commercial buildings to the west.

8.0 ESTIMATED AMBIENT RADIO FREQUENCY FIELDS FOR THE PROPOSED SITE

Based on worst-case predictive modeling, there are no modeled exposures on any accessible rooftop or ground-level walking/working surface related to Sprint's proposed equipment in the area that exceed the FCC's occupational and/or general public exposure limits at this site. As such, the proposed Sprint project is in compliance with FCC rules and regulations.

Maximum Permissible Exposure (MPE) Summary			
Location	% of FCC General Public/Uncontrolled Exposure Limit	% of FCC Occupational/Controlled Exposure Limit	Power Density (mW/cm²)
All Carrier Equipment			
Equipment Shelter Roof	6.20	1.24	0.03307
Ground	5.80	1.16	0.03093
Sprint Equipment			
Equipment Shelter Roof	5.60	1.12	0.02987

The inputs used in the modeling are summarized in the RoofView® export file presented in Appendix D.

There are no modeled areas on the rooftop or ground that exceed the FCC's limits for general public or occupational exposure in front of the other carrier antennas.

9.0 SIGNAGE AT THE FACILITY IDENTIFYING ALL WTS EQUIPMENT AND SAFETY PRECAUTIONS FOR PEOPLE NEARING THE EQUIPMENT AS MAY BE REQUIRED BY THE APPLICABLE FCC ADOPTED STANDARDS (DISCUSS SIGNAGE FOR THOSE WHO SPEAK LANGUAGES OTHER THAN ENGLISH)

Signs are the primary means for control of access to areas where RF exposure levels may potentially exceed the MPE. It is recommended that Notice signs be installed for the new antennas making people aware of the antennas locations. There are no exposures above the FCC limits in front of the proposed antennas and therefore barriers are not recommended.

Workers that are elevated above the rooftop and ground may be exposed to power densities greater than the occupational limit. Workers should be informed about the presence of antennas and their associated fields and practice RF Safety Procedures. To reduce the risk of exposure and/or injury, EBI recommends that access to the monopole or areas associated with the active antenna installation be restricted and secured where possible.

Access to this site is accomplished via a gate in the fence surrounding the monopole. Workers must be elevated to antenna level to access them, so these antennas are not accessible to the general public.

10.0 STATEMENT ON WHO PRODUCED THIS REPORT AND QUALIFICATIONS

Please see the certifications attached in Appendix C below.

11.0 LIMITATIONS

This report was prepared for the use of Sprint. It was performed in accordance with generally accepted practices of other consultants undertaking similar studies at the same time and in the same locale under like circumstances. The conclusions provided by EBI are based solely on the information provided by the client. The observations in this report are valid on the date of the investigation. Any additional information that becomes available concerning the site should be provided to EBI so that our conclusions may be revised and modified, if necessary. This report has been prepared in accordance with Standard Conditions for Engagement and authorized proposal, both of which are integral parts of this report. No other warranty, expressed or implied, is made.

12.0 SUMMARY AND CONCLUSIONS

EBI has prepared this Radiofrequency Emissions Compliance Report for the proposed Sprint telecommunications equipment at the site located at 1397 Dryden Road in Ithaca, New York.

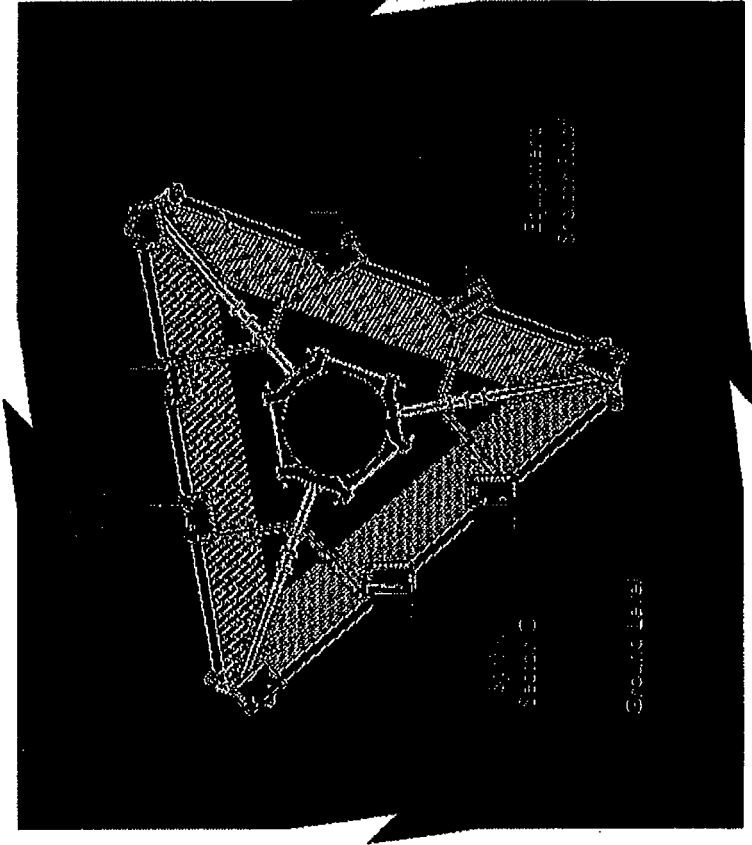
EBI has conducted theoretical modeling to estimate the worst-case power density from proposed Sprint antennas and the other carriers' existing antennas to document potential MPE levels at this location and ensure that site control measures are adequate to meet FCC and OSHA requirements. As presented in the preceding sections, based on worst-case predictive modeling, there are no modeled exposures on any accessible rooftop or ground-level walking/working surface related to Sprint's proposed equipment in the area that exceed the FCC's occupational and/or general public exposure limits at this site. As such, the proposed Sprint project is in compliance with FCC rules and regulations.

Signage is recommended at the site as presented in Section 9.0 and Appendix A. Posting of the signage brings the site into compliance with FCC rules and regulations.

Appendix A

MPE Analysis and Recommended Signage

Post Signs at All
Compound Access Gates



% FCC Public Exposure Limit	
	Exposure Level $\geq 5,000$
	500 < Exposure Level $\leq 5,000$
	100 < Exposure Level ≤ 500
	Exposure Level ≤ 100

Sprint
Antennas

*For Clarity, Other
Carrier Antennas are
Not Shown.

MPE Analysis and Recommended Signage
 Facility Operator: Sprint
 Site Name: NY13/366 CAC
 Sprint Site Number: AL43XC750
 Report Date: August 17, 2018



Appendix B
Federal Communications
Commission (FCC) Requirements

The FCC has established Maximum Permissible Exposure (MPE) limits for human exposure to Radiofrequency Electromagnetic (RF-EME) energy fields, based on exposure limits recommended by the National Council on Radiation Protection and Measurements (NCRP) and, over a wide range of frequencies, the exposure limits developed by the Institute of Electrical and Electronics Engineers, Inc. (IEEE) and adopted by the American National Standards Institute (ANSI) to replace the 1982 ANSI guidelines. Limits for localized absorption are based on recommendations of both ANSI/IEEE and NCRP.

The FCC guidelines incorporate two separate tiers of exposure limits that are based upon occupational/controlled exposure limits (for workers) and general public/uncontrolled exposure limits for members of the general public.

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 public/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.

General public/uncontrolled exposure limits apply to situations in which the general public 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 public 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.

Table I and Figure I (below), which are included within the FCC's OET Bulletin 65, summarize the MPE limits for RF emissions. These limits are designed to provide a substantial margin of safety. They vary by frequency to take into account the different types of equipment that may be in operation at a particular facility and are "time-averaged" limits to reflect different durations resulting from controlled and uncontrolled exposures.

The FCC's MPEs are measured in terms of power (mW) over a unit surface area (cm²). Known as the power density, the FCC has established an occupational MPE of 5 milliwatts per square centimeter (mW/cm²) and an uncontrolled MPE of 1 mW/cm² for equipment operating in the 1900 MHz and 2500 MHz frequency ranges. For the Sprint equipment operating at 800 MHz, the FCC's occupational MPE is 2.66 mW/cm² and an uncontrolled MPE of 0.53 mW/cm². These limits are considered protective of these populations.

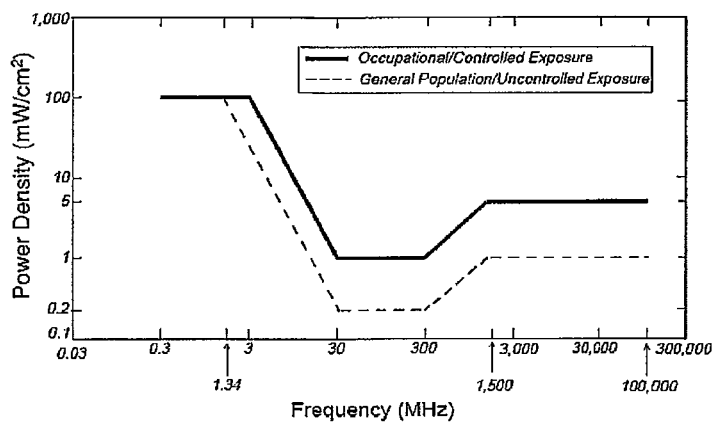
Table I: Limits for Maximum Permissible Exposure (MPE)				
(A) Limits for Occupational/Controlled Exposure				
Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time [E] ² , [H] ² , or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f ²)*	6
30-300	61.4	0.163	1.0	6
300-1,500	--	--	f/300	6
1,500-100,000	--	--	5	6

(B) Limits for General Public/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
300-1,500	--	--	f/1,500	30
1,500-100,000	--	--	1.0	30

f = Frequency in (MHz)

* Plane-wave equivalent power density

Figure 1. FCC Limits for Maximum Permissible Exposure (MPE)
 Plane-wave Equivalent Power Density



Based on the above, the most restrictive thresholds for exposures of unlimited duration to RF energy for several personal wireless services are summarized below:

Personal Wireless Service	Approximate Frequency	Occupational MPE	Public MPE
Personal Communication Services (PCS)	1,950 MHz	5.00 mW/cm ²	1.00 mW/cm ²
Cellular Telephone	870 MHz	2.90 mW/cm ²	0.58 mW/cm ²
Specialized Mobile Radio	855 MHz	2.85 mW/cm ²	0.57 mW/cm ²
Most Restrictive Freq. Range	30-300 MHz	1.00 mW/cm ²	0.20 mW/cm ²

MPE limits are designed to provide a substantial margin of safety. These limits apply for continuous exposures and are intended to provide a prudent margin of safety for all persons, regardless of age, gender, size, or health.

Personal Communication Services (PCS) facilities used by Sprint in this area operate within a frequency range of 800-1900 MHz. Facilities typically consist of: 1) electronic transceivers (the radios or cabinets) connected to wired telephone lines; and 2) antennas that send the wireless signals created by the transceivers to be received by individual subscriber units (PCS telephones). Transceivers are typically connected to antennas by coaxial cables.

Advanced Wireless Services (AWS) facilities used by Sprint in this area operate within a frequency range of 2496 - 2690 MHz. Facilities typically consist of: 1) electronic transceivers (the radios or cabinets); and 2) antennas that send the wireless signals created by the transceivers to be received by individual subscriber units. Transceivers are typically connected to antennas by coaxial cables.

Because of the short wavelength of PCS/AWS services, the antennas require line-of-site paths for good propagation, and are typically installed above ground level. Antennas are constructed to concentrate energy towards the horizon, with as little energy as possible scattered towards the ground or the sky. This design, combined with the low power of PCS facilities, generally results in no possibility for exposure to approach Maximum Permissible Exposure (MPE) levels, with the exception of areas directly in front of the antennas.

FCC Compliance Requirement

A site is considered out of compliance with FCC regulations if there are areas that exceed the FCC exposure limits and there are no RF hazard mitigation measures in place. Any carrier which has an installation that contributes more than 5% of the applicable MPE must participate in mitigating these RF hazards.

Appendix C

Certifications

Preparer Certification

I, Adam Piombino, state that:

- I am an employee of EnviroBusiness Inc. (d/b/a EBI Consulting), which provides RF-EME safety and compliance services to the wireless communications industry.
- I have successfully completed RF-EME safety training, and I am aware of the potential hazards from RF-EME and would be classified "occupational" under the FCC regulations.
- I am fully aware of and familiar with the Rules and Regulations of both the Federal Communications Commissions (FCC) and the Occupational Safety and Health Administration (OSHA) with regard to Human Exposure to Radio Frequency Radiation.
- I have been trained on RF-EME modeling using RoofView® modeling software.
- I have reviewed the data provided by the client and incorporated it into this Site Compliance Report such that the information contained in this report is true and accurate to the best of my knowledge.



Appendix D

RoofView® Export File / Antenna Inventory

Station Data														
ID	Name	Uptime (Mhz)	Trans Freq	Trans Power	Trans Count	Trans Len	Coax Type	Coax Loss	Other Loss	Input Power	Calc Power	Mfg	Model	Type
Station Data (It is advisable to provide an ID (ent. 1) for all antennas)														
SPT A1	Sprint	800	4	10:1/2 LDF	0.5	168.667 RFS	APXVBLL20X 43-C-120	6.88	13.65	64.270	6.88	13.65	64.270	ON*
SPT A2	Sprint	1500	4	10:1/2 LDF	0.5	151.8003 RFS	APXVBLL20X 43-C-120	6.88	15.75	58.270	6.88	15.75	58.270	ON*
SPT A3	Sprint	2500	8	10:1/2 LDF	0.5	134.9336 RFS	APXVTM14-ALU-120	4.69	15.9	65.60	4.69	15.9	65.60	ON*
SPT B1	Sprint	800	4	10:1/2 LDF	0.5	168.667 RFS	APXVBLL20X 43-C-120	6.88	13.65	64.270	6.88	13.65	64.270	ON*
SPT B2	Sprint	1900	4	10:1/2 LDF	0.5	151.8003 RFS	APXVBLL20X 43-C-120	6.88	15.75	58.270	6.88	15.75	58.270	ON*
SPT B3	Sprint	2500	8	10:1/2 LDF	0.5	134.9336 RFS	APXVTM14-ALU-120	4.69	15.9	65.270	4.69	15.9	65.270	ON*
SPT C1	Sprint	800	4	10:1/2 LDF	0.5	168.667 RFS	APXVBLL20X 43-C-120	6.88	13.65	64.2350	6.88	13.65	64.2350	ON*
SPT C2	Sprint	1900	4	10:1/2 LDF	0.5	151.8003 RFS	APXVBLL20X 43-C-120	6.88	15.75	58.2350	6.88	15.75	58.2350	ON*
SPT C3	Sprint	2500	8	10:1/2 LDF	0.5	134.9336 RFS	APXVTM14-ALU-120	4.69	15.9	65.350	4.69	15.9	65.350	ON*
VZW A1	Verizon	850	30			60.14247 Unknown	Unknown							ON*
VZW A2	Verizon	1900	30			60.14247 Unknown	Unknown							ON*
VZW A3	Verizon	2100	40			40.09498 Unknown	Unknown							ON*
VZW B1	Verizon	700	60			30.07123 Unknown	Unknown							ON*
VZW B2	Verizon	850	30			60.14247 Unknown	Unknown							ON*
VZW B3	Verizon	2100	40			40.09498 Unknown	Unknown							ON*
VZW B5	Verizon	700	60			30.07123 Unknown	Unknown							ON*
VZW C1	Verizon	850	30			60.14247 Unknown	Unknown							ON*
VZW C2	Verizon	1900	30			60.14247 Unknown	Unknown							ON*
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Station Data														
ID	Name	Uptime (Mhz)	Trans Freq	Trans Power	Trans Count	Trans Len	Coax Type	Coax Loss	Other Loss	Input Power	Calc Power	Mfg	Model	Type
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SPT C2	Sprint	1900	4	10:1/2 LDF	0.5	151.8003 RFS	APXVBLL20X 43-C-120	6.88	15.75	58.2350	6.88	15.75	58.2350	ON*
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VZW C5	Verizon	700	60			30.07123 Unknown	Unknown							ON*

Map Label Description (notes for this table only)

35 AC Unit Sample symbols

5 Root Access

5 AC Unit

20 Ladder