



MANCHESTER TOWNSHIP

HALF MOON HILL RF EMISSION STUDY

LOT 30 BLOCK 99.200
1481 CAMDEN AVE
MANCHESTER, NJ 08759

July 7, 2026

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Executive Summary

V-COMM, L.L.C. has been commissioned by Manchester Township, to ensure that the proposed radio facility complies with Federal Communications Commission (FCC) regulations as required by the Telecommunications Act of 1996. This report will show through the use of FCC prediction that the radio facility in question will be in compliance with all appropriate Federal regulations in regards to Radio Frequency (RF) exposure.

The analysis performed shows that RF exposure on the ground at the base of the tower is below 0.02% of the FCC's General Public limit. This is 5,000 times below the FCC's standard, with 100% being compliant.

Case Summary

The proposed Half Moon Hill tower site will have a total of four (4) transmitting antennas mounted to the proposed 170 foot lattice tower located at 1481 Camden Ave, Manchester, NJ. The Manchester Township antennas will be mounted with one (1) antenna at a centerline height of 167 feet above ground level (AGL), and remaining antennae at a centerline height of 125 feet (AGL).

Technical information for the proposed antennas for Manchester Township are listed in Table 1.

Table 1 - Technical Data for proposed Manchester Township antennas

	Proposed 1	Proposed 2	Proposed 3	Proposed 4
Antenna Mfg. and Model #	dbSpectra DS7C06P36D	Radiowaves HP3-11	Radiowaves HP3-11	Radiowaves HP3-11
Antenna Centerline (feet)	167	125	125	125
Orientation (deg. TN)	0	37	66	327
Electrical Downtilt (deg.)	-	-	-	-
TX Power - ERP (Watts)	100	400	400	400
Frequency (MHz)	750	11200	11200	11200
# Carriers	8	2	2	2



The calculated Percent of Maximum Permissible Exposure (%MPE) at a height of 6 feet, which represents a 6-foot-tall person on the ground in the area around the tower is less than 0.02% of the FCC's General Public Limit.

The Percent of Maximum Permissible Exposure (%MPE) was also calculated at specific points of interest around the tower. The points below were evaluated at a height of 24 feet below ground level of the tower. This represents a 6-foot-tall person standing on the ground, which at the distances listed below, is at an elevation of 30 feet below the ground level at base of the tower.

- Nearest Occupied Lot boundary (~390 feet from tower): 0.014% of the FCC's General Public Limit
- Nearest Residential Structure (~460 feet from tower): 0.008% of the FCC's General Public Limit

Please note that both values are more than 7,000 times below the FCC Standard for Electro Magnetic Energy Exposure. With 100% of the standard being compliant.

RF Exposure Prediction Methods

The FCC has established the following equation to calculate the cumulative power density in the far-field region.

$$S = \frac{(1.64) \times (0.64) \times NC \times ERP_{relative}}{\pi \times R^2}$$

$$R = \sqrt{V^2 + \Delta h^2}$$

$$ERP_{relative} = 10^{\left[\frac{10 \times \log(P) + MaxAntennaGain - Pattern(\alpha)}{10} \right]}$$

Where:

S = Power Density (milliwatts/cm²)

NC = The number of channel/carriers assigned to the antenna/site

ERP = The maximum Effective Radiated Power of the site (milliwatts)

ERP_{relative} = The Effective Radiated Power taking relative gain and main-beam calculations into account. (milliwatts)

R = The radial distance from antenna to mobile unit (cm)

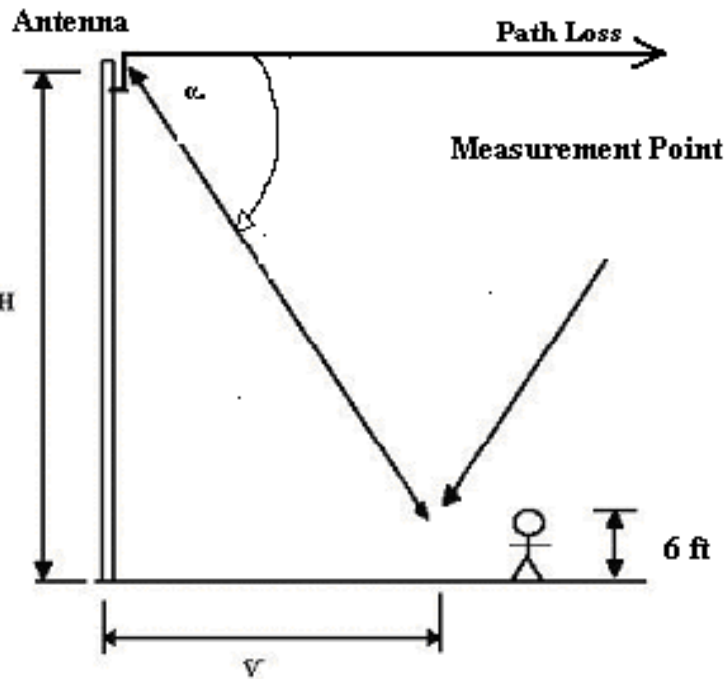
V = The horizontal distance between site and mobile unit (cm)

Δh = The antenna height minus the measurement point (cm)

α = The elevation angle between the main beam of the antenna and any point of reference away from the antenna support structure (degrees)

Pattern (α) = The vertical antenna gain at the specified angle *a* (dBd)

Max Antenna Gain = The maximum antenna gain (dBd)



Please note that calculations were performed using the techniques and procedures outlined in the FCC OET Bulletin No. 65 with particular emphasis on the pattern of antennas and the number of channels per sector.

Federal Regulations

The licensee planning to operate on the proposed installation falls under the jurisdiction of the FCC. Under the authority granted by the Telecommunications Act of 1996 (and stated in Title 47 CFR, Part 1, Section 1307 b), the FCC has mandated that all FCC licensees must be in compliance with RF Emissions guidelines, as defined in OET Bulletin 65, no later than September 1, 2000.

Additionally, as of 1997 the FCC had already made compliance with OET Bulletin 65, a prerequisite for new Common Carrier station authorization. Applicable standards for this analysis will be discussed below.

State & Local Regulations

The Telecommunications Act of 1996 is the applicable Federal statute in regards to the consideration of environmental effects of RF Emissions during the siting process for wireless facilities. In regards to Common Carrier radio service, the Telecommunications Act of 1996 states the following:

“No state or local government or instrumentality thereof may regulate the placement, construction, and modification of personal wireless service facilities on the basis of the environmental effects of radio frequency emissions to the extent that such facilities comply with the Commission’s regulations concerning such emissions.”

Applicable Standards

“The FCC adopted limits for Maximum Permissible Exposure” (MPE) are generally based on recommended exposure guidelines published by the National Council on Radiation Protection and Measurements (NCRP) in ‘Biological Effects and exposure Criteria for Radiofrequency Electromagnetic Fields,’ NCRP Report No. 114, Sections 17.4.1, 17.4.1.1, 17.4.2 and 17.4.3. Copyright NCRP, 19114, Bethesda, MD 20814.

In the frequency range from 100 MHz to 1500 MHz, exposure limits for power density are also generally based on the MPE limits found in Section 4.1 of, “IEEE Standard for Safety Levels With Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz,” ANSI/IEEE C95.1-1992, Copyright 1992 by the IEEE, Inc., NY, NY 10017, and approved for use as an American National Standard by the American National Standards Institute (ANSI). (Paraphrased from FCC OET Bulletin 65). These limits and prediction methodology were reaffirmed in the latest revision of the IEEE standards, ANSI/IEEE Std C95.1-2005 Copyright 2006 by IEEE, Inc., NY, NY 10016-5997, as well as the FCC Report and Order FCC13-39, dated March 27, 2013.

The FCC has adopted 2 different sets of emission standards. The application of each standard is generally based upon the awareness and training of those people exposed to the RF emissions in question.

An uncontrolled environment implies that the people exposed to the RF emissions either have no knowledge that active transmitters are present, or that they have not been properly trained to work safely around active transmitters.

A controlled environment by definition is an environment where the only people exposed to RF emissions from a site (above those background levels that occur naturally) are aware that they are working near active transmitters, and have been fully trained in working safely around RF emissions. The uncontrolled emission standard is stricter than the controlled emission standard, as can be seen below in Table 2 and Table 3.

Table 2 - Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Power Density (mw/cm ²)	Averaging Time (minutes)
0.3 – 3	100 *	6
3 – 30	(900/f ²) *	6
30 – 300	1	6
300 – 1500	f/300	6
1500 – 100000	5	6

Table 3 - Limits for General Population / Uncontrolled Exposure

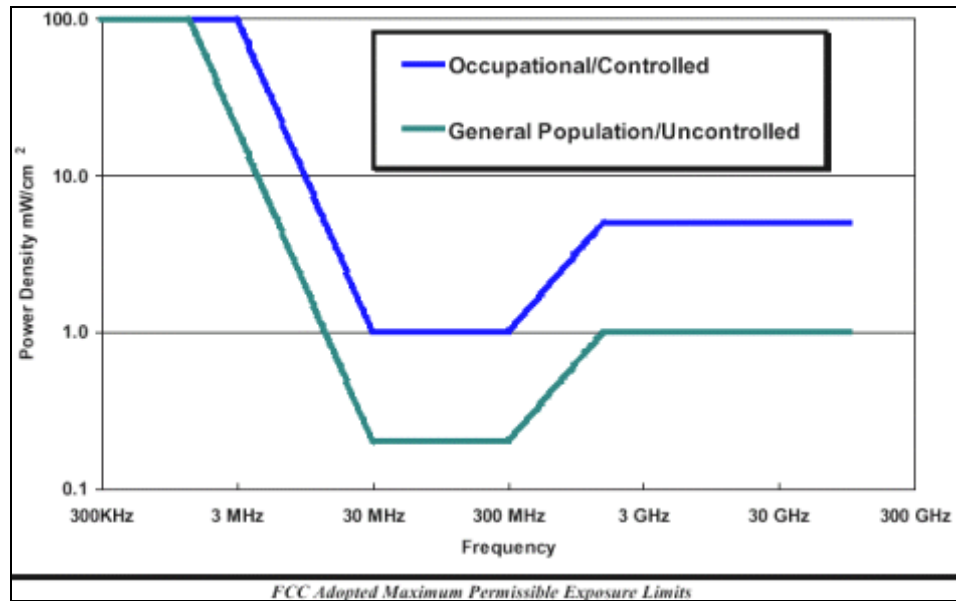
Frequency Range (MHz)	Power Density (mw/cm ²)	Averaging Time (minutes)
0.3 - 1.34	100 *	30
1.34 – 30	(180/f ²) *	30
30 – 300	0.2	30
300 – 1500	f/1500	30
1500 – 100000	1	30

Where: f = Frequency in MHz

* Indicates plane-wave equivalent power density

In general, as specified in 47 C.F.R. 1.1307(b), as amended, when the FCC's guidelines are exceeded in an accessible area due to the emissions from multiple fixed transmitters, the following policy applies. Actions necessary to bring the area into compliance with the guidelines are the shared responsibility of all licensees whose transmitter's contribution to the RF environment at the non-complying area exceeds 5% of the exposure limit that applies to their particular transmitter.

The figure below provides a graphical illustration of both the FCC's occupational and general population MPE limits.





CONCLUSIONS

As detailed above, the calculated % of Maximum Permissible Exposure in the area at the base of the tower is well below the FCC's General Public Limit.

Specific points of interest were also analyzed and the calculated % was also well below the FCC's General Public Limit.

Please note that the power densities calculated for this analysis are a worst-case scenario, as it has been assumed that all transmitters are at full power and constantly in continuous operation.



Certification

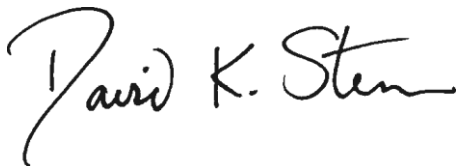
V-COMM, L.L.C. hereby certifies that the site studied in this analysis complies with FCC mandated RF Emission MPE requirements. V-COMM, L.L.C. also certifies that the above results are based on calculations made using FCC prediction methods, with industry standard assumptions and formulas. All results shown in this report have been reviewed and are accurate within reasonable levels of engineering accuracy.

V-COMM, L.L.C. shall not be held responsible for any inaccuracies in data supplied by the carriers. V-COMM, L.L.C. assumes that all transmitting equipment is operating within FCC Type Accepted specifications. A comprehensive field measurement survey was not performed prior to the generation of this report. If questions arise regarding the calculations herein, V-COMM, L.L.C. recommends that a comprehensive field measurement survey be performed.



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President, V-COMM, L.L.C.

07/07/2026



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07/07/2026