

**January 2017
WUBE-FM Channel 286B
Cincinnati, Ohio
RF Exposure Study**

Facilities Proposed

The proposed operation will be on Channel 286B (105.1 MHz) with an effective radiated power of 14.5 kilowatts. Operation is proposed with a 4-level circularly-polarized omni-directional panel antenna system, installed on an existing tower with FCC Antenna Structure Registration Number 1013618.

RF Exposure Calculations

The power density calculations shown below were made using the techniques outlined in OET Bulletin No. 65. "Ground level" calculations in this report have been made at a reference height of 2 meters above ground to provide a worst-case estimate of exposure for persons standing on the ground in the vicinity of the tower. The equation shown below was used to calculate the ground level power density figures from each antenna.

$$S(\mu W / cm^2) = \frac{33.40981 \times AdjERP(Watts)}{D^2}$$

Where: *AdjERP(Watts)* is the maximum lobe effective radiated power times the element pattern factor times the array pattern factor.

D is the distance in meters from the center of radiation to the calculation point.

Ground level power densities have been calculated for locations extending from the base of the tower to a distance of 500 meters. Values past this point are increasingly negligible.

Since the Commission's FMModel software does not include an appropriate element model for the panel antenna system to be used (ERI model 1193-4CP), calculations of the power density produced by the WUBE-FM antenna system assume a Type 1 element pattern, which is the "worst case" element pattern. The highest calculated ground level power density occurs at a distance of 42 meters from the base of the antenna support structure. At this point the power density is calculated to be 10.5 $\mu W/cm^2$.

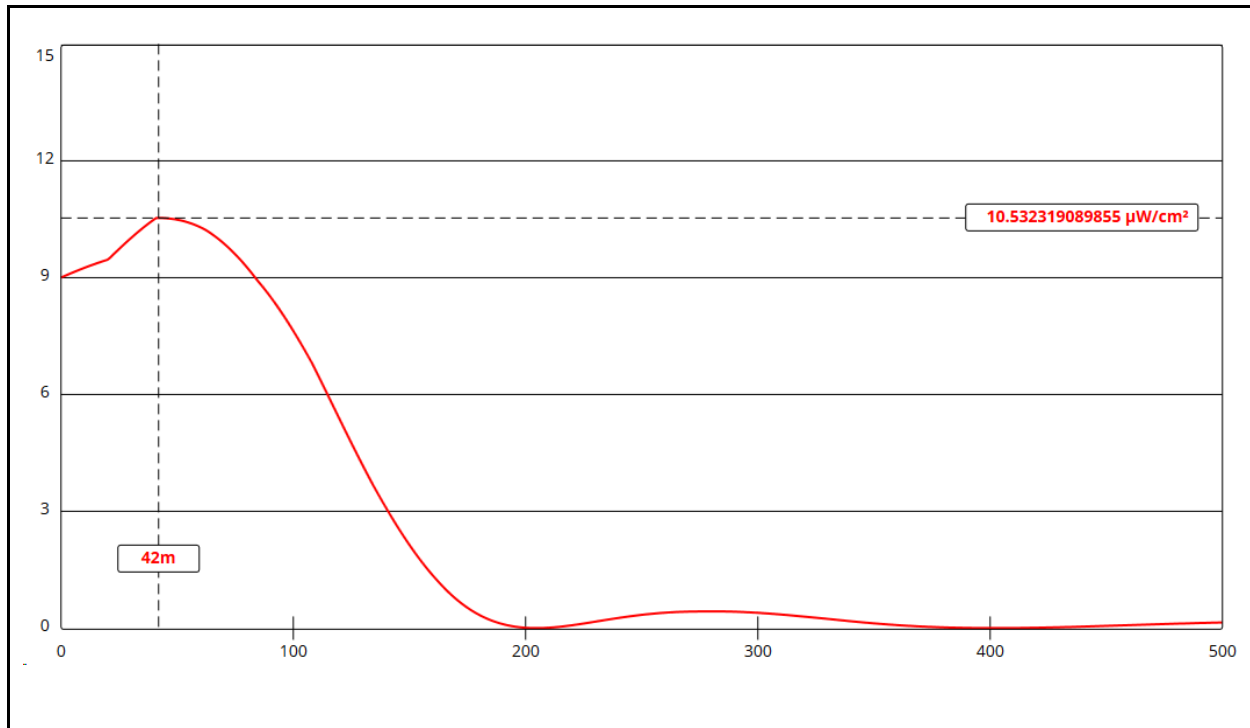
Calculations of the power density produced by WUBE-FM and the other stations at this transmitter site are summarized in the following table:

Call	Avg or Peak ERP Antenna Model	Relative Field	Height AGL	Calculated Max Exposure	Gen Pub FCC Limit	% of Limit
WUBE-FM 286B	14.5 kW H 14.5 kW V ERI 1193-4CP 1.0 wavelength	FMMModel Type 1	234 m	10.5 $\mu\text{W}/\text{cm}^2$	200 $\mu\text{W}/\text{cm}^2$	5.3%
WGUC 215B	18.5 kW H 18.5 kW V ERI SHPX-4AC-SP 1.0 wavelength	FMMModel Type 3	162 m	4.2 $\mu\text{W}/\text{cm}^2$	200 $\mu\text{W}/\text{cm}^2$	2.1%
WVXU 219B	26.0 kW H 26.0 kW V ERI SHPX-4AC-SP 1.0 wavelength	FMMModel Type 3	162 m	5.9 $\mu\text{W}/\text{cm}^2$	200 $\mu\text{W}/\text{cm}^2$	3.0%
WVQC-LP 239L1	0.012 kW H 0.012 kW V SWR FMEC/1	FMMModel Type 2	21 m	0.6 $\mu\text{W}/\text{cm}^2$	200 $\mu\text{W}/\text{cm}^2$	0.3%
WOTH-CD Ch20	15 kW H Scala SL8	0.244	207 m	0.7 $\mu\text{W}/\text{cm}^2$	337 $\mu\text{W}/\text{cm}^2$	0.2%
WCPO-TV Ch22	880 kW H DIE TFU- 36GTH/VP-R O6	0.100 assumed	252 m	4.7 $\mu\text{W}/\text{cm}^2$	345 $\mu\text{W}/\text{cm}^2$	1.4%
WBQC-LD Ch47	15 kW H ERI AL12O-47-PL	0.100	207 m	0.1 $\mu\text{W}/\text{cm}^2$	445 $\mu\text{W}/\text{cm}^2$	0.02%

(For TV facilities, the relative field value indicated is the maximum value which occurs at 45 degrees or more below the horizontal, based on the manufacturer's vertical plane pattern. The resulting adjusted ERP value is assumed to be radiated straight down to a point 2 meters above ground level at the base of the tower.)

These calculations show that the maximum calculated power density produced at two meters above ground level by the proposed operation of WUBE-FM and the present operation of the other stations at this site (were their maxima to coincide, which they do not) is 12.3% of the FCC standard for uncontrolled environments.

The permittee/licensee in coordination with other users of the site must reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency exposure in excess of FCC guidelines.



Ground-Level RF Exposure

OET FMModel

WUBE-FM 286B Cincinnati

Antenna Type: ERI 1193-4CP panel (Type 1 assumed)

No. of Elements: 4

Element Spacing: 1.0 wavelength

Distance: 1000 meters

Horizontal ERP: 14.5 kW

Vertical ERP: 14.5 kW

Antenna Height: 234 meters AGL

Maximum Calculated Power Density is 10.5 $\mu\text{W}/\text{cm}^2$ at 42 meters from the antenna structure.