

# Minor Change Application

## W248BQ; Facility ID No. 155291

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This exhibit is for a Minor Modification of the construction permit for translator W248BQ Facility ID No. 155291, BPFT - 20160422AAG. This request is for a change of antenna model and elevation.

### **Antenna Location**

The proposed antenna is to be mounted on an existing communications tower identified by registration number 1223919 at 149 meters above ground level. A directional antenna, Scala FMVMP-1, rotated to 315°T, is proposed. In **Figure 0** the rotated directional pattern envelope is shown. **Figure 1** is an overlap and spacing study, that takes into account the antenna pattern, from which it can be determined that this proposal is within the protected contour of **second**-adjacent channel stations WSIX-FM and WLVU.

### **73.1204 Compliance**

We will demonstrate that a lack of population and/or other factors allow this proposal to be compliant with 74.1204. The process commonly called "Living Way", allows for the use of D/U Analysis, also known as "signal strength ratio methodology" to be utilized to demonstrate compliance. In this instant case the facility to be protected is on a second or third adjacent channel and is to be afforded protection from signals 40 dB stronger than the protected facility presents in the location of the proposed translator antenna location.

**Concerning WLVU;** In **Figure 2** a map showing the predicted 86.5 dBu signal contour of the protected facility exceeds 0.5 km beyond the proposed translator antenna location is given. This proposal can only cause predicted interference to the protected facility by having a signal exceeding 126.5 dBu (86.5+40) in a habitable/populated area. Utilizing the line of sight equation shown in **Figure 3** it has been determined that a 126.5 dBu signal developed by 250 watts, as proposed will reach a maximum distance from the antenna of 53 meters. With examination of the image in **Figure 4** it can be determined that no habitable space is within this distance.

**Concerning WSIX-FM;** In **Figure 2** a map showing the predicted 94.1 dBu signal contour of the protected facility exceeds 0.5 km beyond the proposed translator antenna location is given. As the WSIX-FM signal is 7.6 dB (94.1-86.5) greater than WLVU, the protection of WLVU assures protection of WSIX-FM.

Thus the provisions of the rules section concerning prohibited overlap will not apply as it has been demonstrated that no actual interference will occur due to a lack of population and other factors as applied in this instant proposal.

### **Minor Change and Fill-In Status**

It can be determined in **Figure 2** that the 60 dBu contour of this proposal overlaps that of the current permit. Thus the “minor change” provisions of §74.1233(a)(1) are met by this request for a change of location with no change of channel. Also on that map it can be seen that the 83 dBu contour of primary station WNRQ completely encompasses the 60 dBu of the proposed translator facility. The 83 dBu contour was used in place of the normal primary 60 dBu fill-in contour to better scale the map.

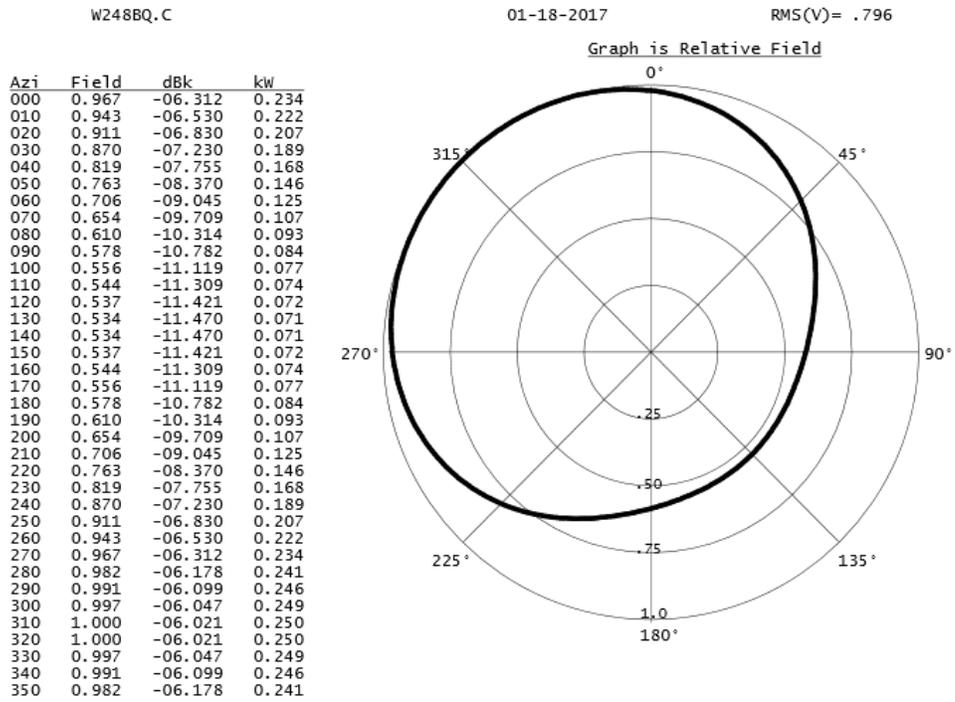
### **RF Fields Statement**

The proposed facilities were evaluated in terms of potential radio frequency radiation exposure at ground level in accordance with OET Bulletin No. 65, “Evaluating Compliance With FCC-Specified Guidelines for Human Exposure to Radio frequency Radiation.”

The proposed antenna system is a Scala FMVMP-1, 1- element, vertical polarity dipole antenna, mounted 149 meters above ground level. For purposes of this analysis the FCC provide web application “FM-Model” was set to use a worst case “Ring and Stub” type of antenna element, operated with an effective radiated power of 0.25 Kilowatts in vertical. At 2 meters above the surface, at 33.75 meters from the base of the tower, this proposal will contribute worst case, 0.4 microwatts per square centimeter, or 0.04 percent of the allowable ANSI limit for controlled exposure, and 0.2 percent of the allowable limit for uncontrolled exposure. This figure is less than 5% of the applicable FCC exposure limit at all locations extending out from the base of the tower. Section 1.1307(b)(3) excludes applications when the calculated level is predicted to be less than 5% of the applicable exposure limit. It is therefore believed that this proposal is in compliance with OET Bulletin Number 65 as required by the Federal Communications Commission.

Further, the applicant will see that signs are posted in the vicinity of the tower, warning of potential radio frequency hazards at the site. The site itself is restricted from public access. The applicant will cooperate with other users of the tower to reduce power of the facility, or discontinue operation, as necessary to limit human exposure to levels less than specified by the Federal Communications Commission should anyone be required to climb the tower for maintenance or inspection.

**Figure 0. Directional Pattern**



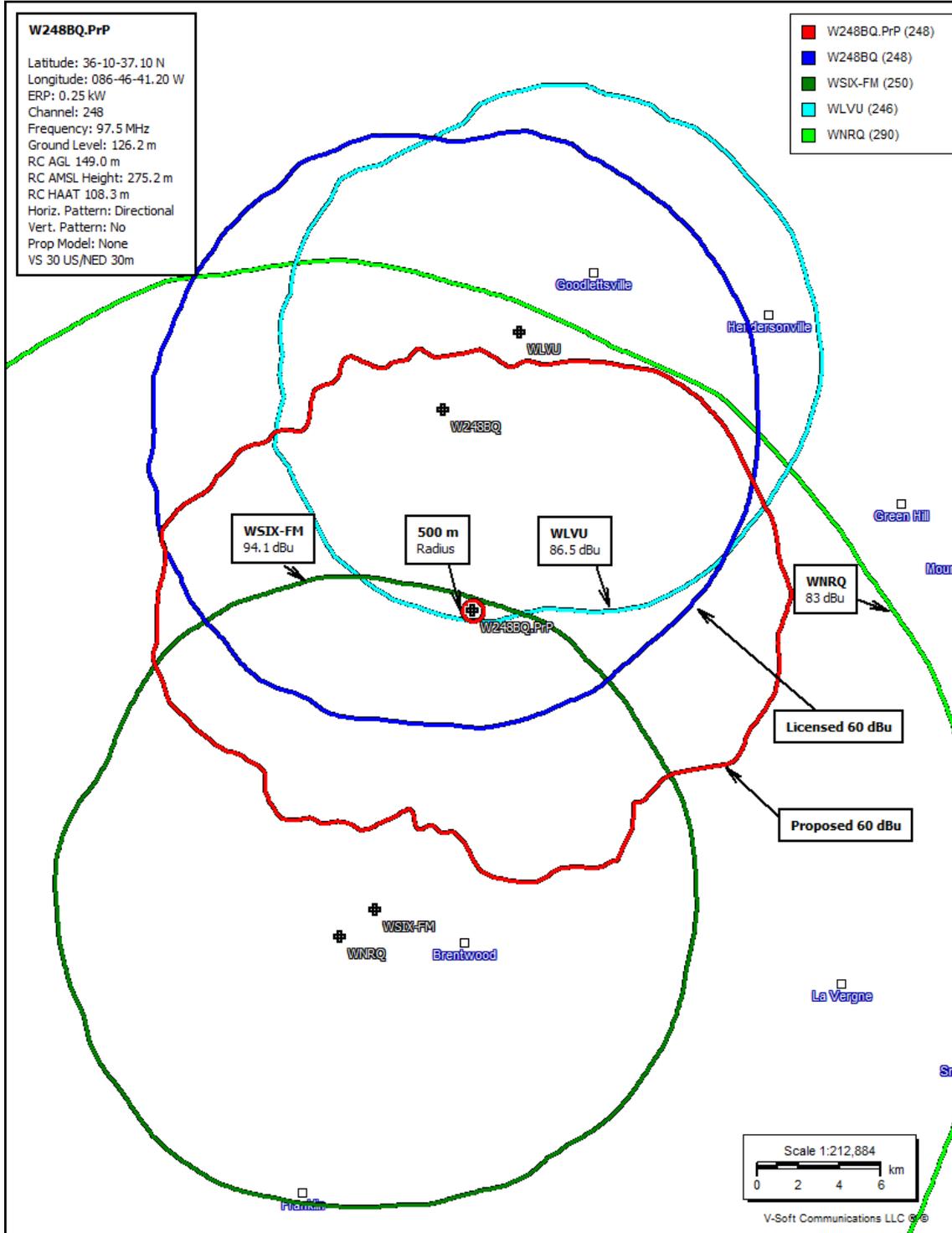
**Figure 1. Overlap and Spacing Study**

W248BQ at 149 m AGL Educational Media Foundation										
REFERENCE	CH#	248D - 97.5 MHz, Pwr= 0.25 kW DA, HAAT= 112.3 M, COR= 275 M		Average Protected F(50-50)= 13.62 km		Standard Directional		DISPLAY DATES		
36 10 37.1 N. 86 46 41.2 W.								DATA 02-23-17	SEARCH 02-23-17	
CH CITY	CALL	TYPE ANT STATE	AZI <--	DIST FILE #	LAT LNG	PWR(kw) HAAT(M)	INT(km) COR(M)	PRO(km) LICENSEE	*IN* (Overlap)	*OUT* (in km)
250CO	WSIX-FM	LIC _CX TN	197.9 17.9	15.15 BMLH20050826ABB	36 02 50.0 86 49 48.0	100.000 349	11.2 550	77.6 Capstar Tx, LLC	-3.9	-63.1*
248D	W248BQ	APP DV_ TN	0.0 0.0	0.00 BMPFT20170215AAN	36 10 37.1 86 46 41.2	0.250	40.8 269	11.9 Educational Media Foundati	-53.1*	-54.1*
248D	W248BQ	CP DV_ TN	0.0 0.0	0.00 BMPFT20170126ACK	36 10 37.1 86 46 41.2	0.250	40.8 269	11.9 Educational Media Foundati	-53.1*	-54.1*
248D	W248BQ	LIC _C_ TN	351.5 171.5	9.76 BLFT20160421AAT	36 15 49.8 86 47 38.9	0.043	51.1 480	15.4 Educational Media Foundati	-53.5*	-47.4*
246C2	AL6633	RSV-A TN	9.5 189.5	13.55 RM11324	36 17 50.0 86 45 11.0	50.000 150	6.5 331	55.3	-4.5	-42.8*
246C2	WLVU	LIC _C_ TN	9.5 189.5	13.55 BMLE20121002ABV	36 17 50.0 86 45 11.0	45.000 158	6.4 338	55.0 Educational Media Foundati	-4.4	-42.5*
248C2	WLLX	LIC _C_ TN	196.6 16.4	103.76 BLH20060206ABL	35 16 56.0 87 06 18.0	42.000 161	134.1 421	50.8 Roger Wright Dba Prospect	-38.3*	26.4
248A	WZZP	LIC _C_ KY	317.5 137.1	88.60 BLH20001127AAB	36 45 47.0 87 26 59.0	6.000 100	87.0 270	28.6 Saga Communications Of Tuc	-10.3	19.2
248D	W248BM	LIC DC_ TN	133.5 313.8	52.83 BLFT20141107AEC	35 50 56.0 86 21 11.0	0.250	37.7 275	11.0 Wycq, Inc.	4.9	7.0
248D	W248CF	LIC _C_ KY	13.3 193.4	89.50 BLFT20170104AAN	36 57 37.0 86 32 49.0	0.250	46.4 297	13.6 Charles M. Anderson	31.2	35.1

Terrain database is NGDC 30 SEC , R= 73.215 qualifying spacings or FCC minimum Spacings in KM, M= Margin in KM  
Contour distances are on direct line to and from reference station. Reference zone= East Zone, Co to 3rd adjacer  
All separation margins (if shown) include rounding.

Ant Column: (D= DA Standard, Z= DA 73.215, N= Not DA 73.215, \_= Omni), Polarization (C,H,V,E), Beamtilt(Y,N,X)  
"="affixed to 'IN' or 'OUT' values = site inside restricted contour.  
Reference station has protected zone issue: AM tower

**Figure 2. Contour Map**



**Figure 3. Signal Level Distance**

<p>Proposed Antenna: Scala FMMP-1</p> <p>Proposed Power: 0.25 kW</p> <p>Antenna Height AGL: 149 meters</p> <p>Interference Contour: 126.5 dBu f(50:10)</p> <p>Artificial Rcv Antenna Height: 2 meters</p> <p>Distance (Free Space) Equation: <math>= (10^{((106.92 - [\text{desired dBu}] + [\text{ERP in dBk}]) / 20)) * 1000}</math></p> <p>Field Strength (dBu) Equation: <math>= 106.92 - (20 * (\text{LOG10}[\text{DistMeters} / 1000])) + [\text{ERP in dBk}]</math></p>								
Depression				Distance				
Angle	Antenna			from Ant.	Distance	Field Strength	Distance	Field Strength
Below	Relative	ERP	ERP	to Interf	rom Ant. to	in dBu @	from Ant.	in dBu @
Horizon	Field	in kW	in dBk	Contour	Artificial Plane	Artificial Plane	to Ground Level	Ground Level
0°	1.000	0.250	-6.02	52.48 m	infinite	---	infinite	---
-5°	0.995	0.248	-6.06	52.21 m	1686.64 m	96.32 dBu	1709.58 m	96.20 dBu
-10°	0.982	0.241	-6.18	51.53 m	846.54 m	102.19 dBu	858.06 m	102.07 dBu
-15°	0.950	0.226	-6.47	49.85 m	567.96 m	105.37 dBu	575.69 m	105.25 dBu
-20°	0.918	0.211	-6.76	48.17 m	429.80 m	107.49 dBu	435.65 m	107.37 dBu
-25°	0.867	0.188	-7.26	45.50 m	347.83 m	108.83 dBu	352.56 m	108.72 dBu
-30°	0.803	0.161	-7.93	42.14 m	294.00 m	109.63 dBu	298.00 m	109.51 dBu
-35°	0.727	0.132	-8.79	38.15 m	256.29 m	109.96 dBu	259.77 m	109.84 dBu
-40°	0.645	0.104	-9.83	33.85 m	228.69 m	109.91 dBu	231.80 m	109.79 dBu
-45°	0.558	0.078	-11.09	29.28 m	207.89 m	109.48 dBu	210.72 m	109.36 dBu
-50°	0.472	0.056	-12.54	24.77 m	191.89 m	108.72 dBu	194.51 m	108.60 dBu
-55°	0.388	0.038	-14.24	20.36 m	179.45 m	107.60 dBu	181.90 m	107.48 dBu
-60°	0.310	0.024	-16.19	16.27 m	169.74 m	106.13 dBu	172.05 m	106.01 dBu
-65°	0.240	0.014	-18.42	12.59 m	162.20 m	104.30 dBu	164.40 m	104.19 dBu
-70°	0.176	0.008	-21.11	9.24 m	156.43 m	101.92 dBu	158.56 m	101.81 dBu
-75°	0.119	0.004	-24.51	6.24 m	152.19 m	98.76 dBu	154.26 m	98.65 dBu
-80°	0.067	0.001	-29.50	3.52 m	149.27 m	93.94 dBu	151.30 m	93.82 dBu
-85°	0.019	0.000	-40.45	1.00 m	147.56 m	83.10 dBu	149.57 m	82.98 dBu
-90°	0.025	0.000	-38.06	1.31 m	147.00 m	85.51 dBu	149.00 m	85.39 dBu

**Figure 4. Image of Proposed Location**

