

Kean Consultants  
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**ANALYSIS OF WMUC-FM SIGNAL  
INTERFERENCE TO WCSP-FM FOR A NEW  
FACILITY ON CHANNEL 211**

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**November 27, 2018**

## Introduction

WMUC-FM is a Non-Commercial Educational FM (“NCE-FM”) Class D station that is licensed on FM channel 201 (88.1 MHz) to the University of Maryland (“UMD”). It was first licensed in 1980. WYPR(FM), Baltimore, MD is a co-channel FM station that was first licensed as a Class D operation in 1979. WYPR boosted its power to 15.5 watts in 2002, becoming a full-service Class B1 station. WYPR’s transmitter site is located only 45 kilometers from WMUC-FM, which results in contour overlap that would normally be prohibited, however, Section 73.509 of the FCC rules allow full-service stations to exclude Class D from consideration in their allocation studies. As a result of the power increase, WMUC-FM began to receive interference from WYPR, severely restricting its coverage, even to some listeners on the UMD campus. Similarly, WYPR has received co-channel interference in the vicinity of WMUC-FM. WYPR’s description on *Wikipedia* states:<sup>1</sup>

“While the University of Maryland student station, WMUC, broadcasts on the same frequency as WYPR, WMUC is designated as a class D station and thus its signal is not protected, rendering both stations practically unlistenable in parts of Prince George's County, Montgomery County and Northeastern D.C. due to WYPR's interference with WMUC.”

As discussed below, no FM channels in the Reserved Band (88.1 to 91.1 MHz) or Non-Reserved Band (92.1 to 107.9 MHz) fully meet the contour protection requirements for a channel change for WMUC-FM. However, Commission policy allows Class D stations in such conditions to request a new channel that involves second-adjacent channel contour overlap with a full service station, provided that the full service station accepts the overlap. At WMUC-FM’s location, only channel 213 meets the second-adjacent overlap allowance, which is second-adjacent to WCSP-FM, channel 211B and WETA-FM, channel 215B.

To resolve this long-standing mutual interference, UMD seeks a change to channel 213 that will eliminate interference that is both received and caused by WMUC-FM. This report documents the *de minimis* amount of contour overlap with WCSP-FM.

## Engineering Study

Attached as Table 1 are the results of a full reserved band and commercial band FM channel study (channels 201 to 300) showing that all FM channels except channel 213 are precluded for use as an alternative to the licensed channel 201, due to co- or first-adjacent channel interference that would be caused to co-channel and first adjacent-channel FM stations. (For channel 200, this study indicates that use is precluded by low-power television station WDCN-LP, channel 6, in Fairfax, Virginia. WMUC-FM is located within the 62 dBμ service contour of WDCN-LP, and channel 200 is within the 82-88 MHz band for channel 6.

Assessment of the overlap of WMUC-FM’s proposed facility on channel 213, relative to WCSP-FM, was determined from the signal interference ratio in §73.509 of the Commission’s rules. For stations

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<sup>1</sup> <https://en.wikipedia.org/wiki/WYPR>

separated by 400 kHz (second-adjacent channel) this rule specifies contour values of 100 dBμ (100 mV/m) for the interfering station to 60 dBμ (1 mV/m) for the protected station – a ratio of 40 dB. The map of Figure 1 shows that WMUC-FM is located within WCSP-FM's 60 dBμ service area, at a field strength contour value of approximately 97 dBμ. This requires that the 40 dB signal ratio be applied to the actual field strength:

$$97 \text{ dB}\mu + 40 \text{ dB}\mu = 137 \text{ dB}\mu$$

Figure 2 shows a smaller-scale map around the WMUC-FM site, which is located between WCSP-FM's 97 dBμ and 98 dBμ contours. The 137 dBμ contour for the proposed WMUC-FM operation is shown. A more accurate determination of the distance to the 137 dBμ contour, based on a standard formula for free-space propagation, is:

$$E \text{ (dB}\mu\text{)} = 106.9 - 20\log_{10}d \text{ (km)} + \text{ERP (dBk)}$$

Solving for 137 dBμ and an ERP of 30 Watts (-15.2 dBk), *d* is approximately 6 meters. This radius is shown in Figure 3 on an official map of the University of Maryland. WMUC-FM's antenna is located on the South Campus Dining Hall, which is not a residential building. The calculated interference area of the proposed operation encompasses only minute transient population, and is thus suggested to have a *de minimis* effect of WCSP-FM's service.

#### PROPOSED FACILITY

- A. Channel 213D (90.5 MHz)
- B. Transmitter Site (No change):
  - 1. Address: 3130 S. Campus Dining Hall, College Park, MD 20742
  - 2. Coordinates: N 38° 58' 59"; W 76° 56' 37" (NAD 27)
- C. Antenna Centerline:
  - 1. 26 meters AGL (66 meters AMSL)
  - 2. 4 meters HAAT (Globe Terrain Database)
- D. Antenna Type: Non-directional
- E. ERP: 30 watts, H&V

The changes proposed in WMUC-FM's facility are only two: a change in frequency from 88.1 MHz to 90.5 MHz and an increase in effective radiated power from 10 Watts to 30 Watts. The change is believed to be permissible for Class D FM stations under the Commission's rules; however, should a lower effective radiated power be authorized, the effect of the facility as described herein would be reduced further.

**Summary**

This study found that only one frequency, 90.5 MHz, could be used by WMUC-FM for a channel change that could end the severe co-channel interference problem with WYPR, Baltimore. While this channel is second-adjacent to WCSP-FM, the study demonstrates that the calculated interference area is miniscule, and involves no residential population. The condition thus meets the designation of *de minimis* interference, which the undersigned hopes will be acceptable to the management of WCSP-FM

Respectfully submitted,

A handwritten signature in black ink, appearing to read "John Kean". The signature is written in a cursive, somewhat stylized font.

Table 1 - Channel Preclusion Study for WMUC-FM

Precluding Channel(s)	Call Coords.	Chan_Cls_Srvs_Freq_Status	City	State	File No.	Facility ID	ERP (kW) DA?	HAAT (m)	Dist (km)	Azimuth to (deg T)
<b>200</b>	WDCN-LP N 38 53 45.00 W 77 08 06.80 SIGNAL ABOVE LLC	6 TV 82-88 MHz LIC	Fairfax	VA	BLTVL-20070410ACR	20450	3 DA	119.0	19.2	59.7
<b>201</b>	WYPR N 39 19 53.00 W 76 39 28.00 WYPR LICENSE HOLDING LLC	201 B1 FM 88.1 MHz LIC	BALTIMORE	MD	BLED-20080111AEE	65753	15.5 DA	129.6	45.9	32.4
<b>202, 203 &amp; 204</b>	WAMU N 38 56 10.00 W 77 5 33.00 BOARD OF TRUSTEES OF AMERICAN UNIVERSITY	203 B FM 88.5 MHz LIC	WASHINGTON	DC	BMLED-20070112AHP	65399	50	152.0	13.9	248.0
<b>204, 205 &amp; 206</b>	WEAA N 39 20 31.00 W 76 35 13.00 MORGAN STATE COLLEGE	205 B1 FM 88.9 MHz LIC	BALTIMORE	MD	BLED-1622	43794	12.5	67.0	50.4	37.5
<b>206, 207 &amp; 208</b>	WPFW N 38 56 9.00 W 77 5 33.00 PACIFICA FOUNDATION, INC.	207 B FM 89.3 MHz LIC	WASHINGTON	DC	BLED-1662	51255	50	125.0	13.9	247.9
<b>208, 209 &amp; 210</b>	WTMD N 39 24 10.00 W TOWSON UNIVERSITY	209 B1 FM 89.7 MHz LIC	TOWSON	MD	BLED-20130708ABE	67461	7.4 DA	122.0	55.1	32.0
<b>210, 211 &amp; 212</b>	WCSP-FM N 38 57 44.00 W 77 1 36.00	211 B FM 90.1 MHz LIC	WASHINGTON	DC	BMLED-20130221AAZ	68950	36 DA	173.0	7.6	252.1

NATIONAL CABLE SATELLITE CORPORATION

**CHANNEL 213 IS AVAILABLE WITH DE MINIMIS SECOND ADJACENT-CHANNEL INTERFERENCE WAIVER**

<b>214, 215 &amp; 216</b>	WETA	215 B FM 90.9 MHz LIC	WASHINGTON	DC	BMLED-20070511AAI	65669	75	186.0	19.2	238.1
	N 38 53 30.00 W 77 7 55.00 GREATER WASHINGTON EDUCATIONAL TELECOMMUNICATIONS ASSN.									
<b>217, 218 &amp; 219</b>	WBJC	218 B FM 91.5 MHz LIC	BALTIMORE	MD	BLED-20101109ABJ	3654	50	152.0	48.4	22.2
	N 39 23 11.00 W 76 43 52.00 BALTIMORE CITY COMMUNITY COLLEGE						DA			
<b>219, 220 &amp; 221</b>	WGTS	220 B FM 91.9 MHz LIC	TAKOMA PARK	MD	BMLED-20070501AAA	12460	23.5	186.0	19.2	238.1
	N 38 53 30.00 W 77 7 55.00 WGTS/COLUMBIA UNION COLLEGE BROADCASTING, INC.									
<b>221, 222 &amp; 223</b>	WERQ-FM	222 B FM 92.3 MHz LIC	BALTIMORE	MD	BLH-20130830ACP	68827	37	173.0	46.1	31.1
	N 39 20 18.00 W 76 40 0.00 1048112 RADIO ONE LICENSES, LLC						DA			
<b>224</b>	WDCJ	224 A FM 92.7 MHz LIC	PRINCE FRED.	MD	BMLH-20050228AAV	43277	2.85	145.0	45.8	138.6
	N 38 40 26.00 W 76 35 41.00 RED ZEBRA BROADCASTING LICENSEE, LLC									
<b>225, 226 &amp; 227</b>	WPOC	226 B FM 93.1 MHz LIC	BALTIMORE	MD	BLH-20000714ABE	47747	16	264.0	37.5	25.7
	N 39 17 13.00 W 76 45 16.00 CITICASTERS LICENSES, INC.						DA			
<b>225, 226 &amp; 227</b>	WPOC	226 B FM 93.1 MHz APP	BALTIMORE	MD	BPH-20160526AAJ	47747	16	264.0	37.5	25.7
	N 39 17 13.60 W 76 45 17.10 CITICASTERS LICENSES, INC.						DA			

227	WFLS-FM N 38 18 46.00 W 77 26 20.00 ALPHA MEDIA LICENSEE LLC	227 B FM 93.3 MHz LIC	FREDERICKSBURG	VA	BLH-19880809LD	65641	50	150.0	86.0	210.1
227, 228 & 229	W228DI N 39 2 32.00 W 77 2 49.00 WASHINGTON DC FCC LICENSE SUB, LLC	228 D FX 93.5 MHz LIC	SILVER SPRING	MD	BLFT-20170301ACQ	138906	0.13 DA	0.0	11.1	306.4
229, 230 & 231	WKYS N 38 56 24.00 W 77 4 54.00 RADIO ONE LICENSES, LLC	230 B FM 93.9 MHz LIC	WASHINGTON	DC	BMLH-20080505ACH	73200	24.5	215.0	12.9	248.2
232	WMMP-LP N 39 1 47.60 W 76 44 24.60 THE BRIDGE FOUNDATION CORPORATION	232 LI FL 94.3 MHz CP	BOWIE	MD	BNPL-20131114AZX	197146	0.0047	136.6	18.4	73.4
232	WOWD-LP N 38 58 28.40 W 77 0 38.10 HISTORIC TAKOMA INC.	232 LI FL 94.3 MHz LIC	TAKOMA PARK	MD	BLL-20160714ABK	195180	0.02	67.0	5.9	260.8
232	W257BW N 39 2 12.00 W 77 12 9.00 WIN RADIO BROADCASTING CORP.	232 D FX 94.3 MHz CP	POTOMAC	MD	BPFT-20160129AUE	141566	0.25 DA	0.0	23.2	285.0
233, 234 & 235	WIAD N 38 57 49.00 W 77 6 18.00 CBS RADIO EAST INC.	234 B FM 94.7 MHz LIC	BETHESDA	MD	BMLH-20130308AD0	9619	20.5	235.0	14.2	261.2
235, 236 & 237	WRBS-FM N 39 15 21.00 W 76 40 29.00	236 B FM 95.1 MHz LIC	BALTIMORE	MD	BLH-19851121KH	52353	50 DA	152.0	38.2	37.3

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PETER & JOHN RADIO FELLOWSHIP, INC.

<b>237, 238 &amp; 239</b>	WPGC-FM	238 B FM 95.5 MHz LIC	MORNINGSIDE	MD	BMLH-20101108ABS	28632	50	148.0	13.6	168.0
	N 38 51 49.00 W 76 54 40.00									
	CBS RADIO INC. OF MARYLAND									
<b>240</b>	WWIN-FM	240 A FM 95.9 MHz LIC	GLEN BURNIE	MD	BMLH-19920325KC	54710	3	91.0	40.7	52.6
	N 39 12 16.00 W 76 34 7.00									
	RADIO ONE LICENSES, LLC									
<b>241, 242 &amp; 243</b>	WHUR-FM	242 B FM 96.3 MHz LIC	WASHINGTON	DC	BLED-20040413AAY	65707	16.5	244.0	12.4	252.8
	N 38 57 1.00 W 77 4 47.00									
	THE HOWARD UNIVERSITY									
<b>244</b>	WQER-LP	244 LI FL 96.7 MHz LIC	ROCKVILLE	MD	BLL-20170109ACK	196784	0.018	71.0	22.7	305.6
	N 39 6 6.60 W 77 9 27.10									
	CHINESE AMERICAN COMMUNITY CONNECTION, INC.									
<b>244</b>	WERA-LP	244 LI FL 96.7 MHz LIC	ARLINGTON	VA	BLL-20151208AAC	195167	0.021	66.0	16.2	230.2
	N 38 53 23.60 W 77 5 12.80									
	ARLINGTON INDEPENDENT RADIO									
<b>245, 246 &amp; 247</b>	WASH	246 B FM 97.1 MHz LIC	WASHINGTON	DC	BMLH-20040610ABF	70933	17.5	242.0	12.4	252.8
	N 38 57 1.00 W 77 4 47.00									
	AMFM RADIO LICENSES, L.L.C.									
<b>247, 248 &amp; 249</b>	W248BN	248 D FX 97.5 MHz LIC	ALEXANDRIA	VA	BLFT-20160920ACI	18863	0.25	0.0	14.2	261.4
	N 38 57 50.00 W 77 6 18.00									
	METRO RADIO, INC.									
<b>249, 250 &amp; 251</b>	WIYY	250 B FM 97.9 MHz LIC	BALTIMORE	MD	BLH-19880914KA	65693	13.5	288.0	46.5	32.8

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	N 39 20 5.00 W 76 39 3.00 HEARST STATIONS INC.									
251, 252 & 253	W252DC	252 D FX 98.3 MHz CP	RESTON	VA	BPFT-20160127ACL	138787	0.2	0.0	14.2	261.4
	N 38 57 50.00 W 77 6 18.00						DA			
	RESTON TRANSLATOR, LLC									
252	W252DC	252 D FX 98.3 MHz LIC	RESTON	VA	BLFT-20160113ABB	138737	0.25	0.0	30.3	273.5
	N 38 59 56.00 W 77 17 32.00									
	RESTON TRANSLATOR, LLC									
253, 254 & 255	WMZQ-FM	254 B FM 98.7 MHz LIC	WASHINGTON	DC	BMLH-20060228AMC	73305	50	149.0	24.7	244.4
	N 38 53 13.00 W 77 12 3.00									
	AMFM RADIO LICENSES, L.L.C.									
255, 256 & 257	WDCH-FM	256 B FM 99.1 MHz LIC	BOWIE	MD	BLH-20111110AJC	72177	45	157.0	18.4	73.4
	N 39 1 48.00 W 76 44 25.00									
	CBS RADIO EAST INC.									
257, 258 & 259	WIHT	258 B FM 99.5 MHz LIC	WASHINGTON	DC	BLH-19931215KE	25080	22	229.0	14.2	261.2
	N 38 57 49.00 W 77 6 18.00									
	AMFM RADIO LICENSES, L.L.C.									
260	WFRE	260 B FM 99.9 MHz LIC	FREDERICK	MD	BLH-20070612AAN	31139	7.6	355.0	74.8	320.4
	N 39 30 0.00 W 77 29 58.00									
	ALOHA STATION TRUST, LLC									
261, 262 & 263	WBIG-FM	262 B FM 100.3 MHz LIC	WASHINGTON	DC	BLH-20070720ABU	54459	50	149.0	24.7	244.4
	N 38 53 13.00 W 77 12 3.00									
	AMFM RADIO LICENSES, L.L.C.									

263, 264 & 265	WZBA	264 B FM 100.7 MHz LIC	WESTMINSTER	MD	BLH-20081117ADX	59985	25	210.0	53.4	15.2
	N 39 26 50.00 W 76 46 48.00						DA			
	SHAMROCK COMMUNICATIONS, INC.									
265, 266 & 267	WWDC	266 B FM 101.1 MHz LIC	WASHINGTON	DC	BMLH-20130909ABL	8682	22.5	232.0	10.0	280.7
	N 38 59 59.00 W 77 3 27.00									
	AMFM RADIO LICENSES, L.L.C.									
268	WBQB	268 B FM 101.5 MHz LIC	FREDERICKSBURG	VA	BLH-19910701KC	41812	50	150.0	82.2	208.6
	N 38 19 57.00 W 77 23 41.00						DA			
	CENTENNIAL LICENSING II, LLC									
269, 270 & 271	WLIF	270 B FM 101.9 MHz LIC	BALTIMORE	MD	BLH-20151117AJM	28637	13.5	290.0	58.9	34.6
	N 39 25 7.00 W 76 33 17.00									
	CBS RADIO WLIF, INC.									
271, 272 & 273	WMMJ	272 A FM 102.3 MHz LIC	BETHESDA	MD	BLH-19990506KA	54712	2.9	146.0	13.9	248.0
	N 38 56 10.00 W 77 5 33.00									
	RADIO ONE LICENSES, LLC									
273, 274 & 275	WQSR	274 B FM 102.7 MHz LIC	BALTIMORE	MD	BLH-19890117KE	63778	50	133.0	48.4	22.2
	N 39 23 11.00 W 76 43 52.00									
	CITICASTERS LICENSES, INC.									
276	WAFY	276 A FM 103.1 MHz LIC	MIDDLETOWN	MD	BLH-19900514KB	3728	1	174.0	68.2	315.4
	N 39 25 5.00 W 77 30 3.00									
	MANNING BROADCASTING INC.									
276	WRNR-FM	276 A FM 103.1 MHz LIC	GRASONVILLE	MD	BLH-19930104KD	70351	6	100.0	66.5	93.6
	N 38 56 37.00 W 76 10 43.00									
	EMPIRE BROADCASTING SYSTEM, INC.									

<b>277, 278 &amp; 279</b>	WTOP-FM	278 B FM 103.5 MHz LIC N 38 56 10.00 W 77 5 33.00 WASHINGTON DC FCC LICENSE SUB, LLC	WASHINGTON	DC	BMLH-20110215ABQ	11845	44	158.0	13.9	248.0
<b>280, 281 &amp; 282</b>	WPRS-FM	281 B FM 104.1 MHz LIC N 38 37 7.40 W 76 50 39.00 RADIO ONE LICENSES, LLC	WALDORF	MD	BMLH-20070809ABE	74212	20	244.0	41.4	168.0
<b>281, 282 &amp; 283</b>	WZFT	282 B FM 104.3 MHz LIC N 39 20 10.00 W 76 38 59.00 CITICASTERS LICENSES, INC.	BALTIMORE	MD	BLH-20090123AAG	8684	13 DA	294.0	46.7	32.8
<b>283, 284 &amp; 285</b>	W284CQ	284 D FX 104.7 MHz LIC N 38 59 59.60 W 77 3 26.10 AMFM RADIO LICENSES, LLC	WASHINGTON	DC	BLFT-20160322ACP	31140	0.099 DA	0.0	10.0	280.8
<b>285, 286 &amp; 287</b>	WAVA-FM	286 B FM 105.1 MHz LIC N 38 53 30.00 W 77 7 55.00 SALEM MEDIA OF VIRGINIA, INC.	ARLINGTON	VA	BLH-20070426ACO	4644	33	184.0	19.2	238.1
<b>288, 289 &amp; 290</b>	WJZ-FM	289 B FM 105.7 MHz LIC N 39 19 26.00 W 76 32 56.00 1029766 CBS RADIO STATIONS INC.	CATONSVILLE	MD	BMLH-20121003ABI	1916	50 DA	150.0	51.0	41.8
<b>289, 290 &amp; 291</b>	WMAL-FM	290 B FM 105.9 MHz LIC N 38 52 28.00 W 77 13 24.00 RADIO LICENSE HOLDINGS LLC	WOODBIDGE	VA	BLH-19851021KC	70037	28 DA	198.0	27.1	243.6
<b>292, 293 &amp; 294</b>	WWMX	293 B FM 106.5 MHz LIC N 39 20 4.60 W 76 39 3.10	BALTIMORE	MD	BLH-20130107ABF	74196	11	288.2	46.5	32.8

	CBS RADIO STATIONS INC.									
<b>293, 294 &amp; 295</b>	WJFK-FM	294 B FM 106.7 MHz LIC	MANASSAS	VA	BLH-20141121AHM	28625	20	223.0	27.1	243.6
	N 38 52 28.00 W 77 13 25.00						DA			
	CBS RADIO INC. OF WASHINGTON, DC									
<b>296, 297 &amp; 298</b>	WRQX	297 B FM 107.3 MHz LIC	WASHINGTON	DC	BLH-20040421AFF	73252	19.5	246.0	12.4	252.8
	N 38 57 1.00 W 77 4 47.00									
	RADIO LICENSE HOLDINGS LLC									









