

ENGINEERING EXHIBIT

Incentive Auction Channel Reassignment

Application for Digital Television Station Auxiliary Antenna Construction Permit

prepared for

Hearst Properties Inc.

WMOR-TV Lakeland, FL

Facility ID 53819

Ch. 18 841 kW 394 m

Hearst Properties Inc. (“Hearst”) is the licensee of digital television station WMOR-TV, Facility ID 53819, Lakeland FL. Reassignment of WMOR-TV from Channel 19 to Channel 18 was specified in the *Incentive Auction Closing and Channel Reassignment Public Notice* (DA 17-317, released April 13, 2017). A Construction Permit (“CP”, file# 0000064337) authorizes construction of the WMOR-TV post-auction facility on Channel 18. *Hearst* herein seeks authorization for an auxiliary antenna for WMOR-TV on its post-auction Channel 18.

The reassignment CP authorizes WMOR-TV to operate with a nondirectional antenna at 1000 kW effective radiated power (ERP) and 459 meters height above average terrain (HAAT). The proposed auxiliary antenna will be side-mounted on the same tower structure as the authorized main antenna, and will operate on Channel 18 at 841 kW ERP (directional) and an antenna HAAT of 394 meters.

The WMOR-TV tower structure is associated with FCC Antenna Structure Registration number 1057473. No change to the overall structure height will result from this proposal.

The proposed antenna is a horizontally polarized directional Dielectric model TFU-16WB C160. The directional antenna’s azimuthal pattern is supplied in Figure 1 and the elevation pattern is depicted in Figure 2.

Figure 3 shows that the 41 dBμ noise limited service contour of the proposed auxiliary facility does not extend beyond that of the authorized main facility. Thus the proposal complies with §73.1675(a).

Human Exposure to Radiofrequency Electromagnetic Field (Environmental)

The proposed operation was evaluated for human exposure to RF energy using the procedures outlined in the FCC's OET Bulletin Number 65. Based on OET-65 equation (10), and considering 10 percent antenna relative field in downward elevations (pattern data shows less than 10 percent relative field at angles 25 to 90 degrees below the antenna), the calculated signal density near the tower at two meters above ground level attributable to the proposed facility is $1.8 \mu\text{W}/\text{cm}^2$, which is 0.6 percent of the general population/uncontrolled maximum permitted exposure limit. This is well below the five percent threshold limit described in §1.1307(b) regarding sites with multiple emitters, categorically excluding the applicant from responsibility for taking any corrective action in the areas where the proposal's contribution is less than five percent.

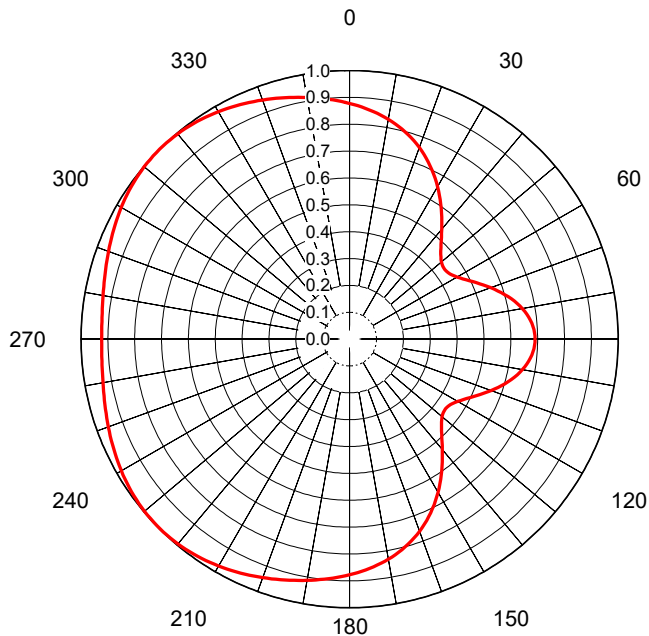
The general public will not be exposed to RF levels attributable to the proposal in excess of the FCC's guidelines. RF exposure warning signs will continue to be posted. With respect to worker safety, the applicant will coordinate exposure procedures with all pertinent stations and will reduce power or cease operation as necessary to protect persons having access to the site, tower, or antenna from RF electromagnetic field exposure in excess of FCC guidelines. This exhibit is limited to the evaluation of exposure to RF electromagnetic field.

List of Attachments

Figure 1	Antenna Azimuthal Pattern
Figure 2	Antenna Elevation Pattern
Figure 3	Proposed Auxiliary Contours

Chesapeake RF Consultants, LLC

Joseph M. Davis, P.E.	December 6, 2019	
207 Old Dominion Road	Yorktown, VA 23692	703-650-9600



AZIMUTH PATTERN Horizontal Polarization

In Free Space

Proposal No. **C-71170-1**
Date **28-Jun-18**
Call Letters **WMOR**
Channel **18**
Frequency **497 MHz**
Antenna Type **TFU-16WB C160**
Gain **1.5 (1.76dB)**
Calculated

Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.878	36	0.582	72	0.581	108	0.581	144	0.585	180	0.877	216	0.989	252	0.950	288	0.950
1	0.874	37	0.569	73	0.591	109	0.571	145	0.598	181	0.881	217	0.991	253	0.948	289	0.953
2	0.870	38	0.557	74	0.601	110	0.560	146	0.610	182	0.885	218	0.992	254	0.945	290	0.955
3	0.865	39	0.545	75	0.611	111	0.549	147	0.622	183	0.888	219	0.994	255	0.943	291	0.958
4	0.861	40	0.533	76	0.621	112	0.538	148	0.635	184	0.892	220	0.995	256	0.941	292	0.961
5	0.856	41	0.522	77	0.630	113	0.528	149	0.647	185	0.895	221	0.996	257	0.939	293	0.963
6	0.852	42	0.511	78	0.638	114	0.517	150	0.658	186	0.899	222	0.997	258	0.936	294	0.966
7	0.847	43	0.500	79	0.646	115	0.507	151	0.670	187	0.902	223	0.998	259	0.934	295	0.969
8	0.842	44	0.490	80	0.653	116	0.497	152	0.681	188	0.905	224	0.998	260	0.933	296	0.972
9	0.836	45	0.481	81	0.660	117	0.488	153	0.693	189	0.909	225	0.998	261	0.931	297	0.974
10	0.831	46	0.472	82	0.666	118	0.480	154	0.703	190	0.912	226	0.998	262	0.929	298	0.977
11	0.825	47	0.464	83	0.672	119	0.472	155	0.714	191	0.915	227	0.998	263	0.928	299	0.979
12	0.819	48	0.457	84	0.677	120	0.464	156	0.724	192	0.919	228	0.998	264	0.927	300	0.982
13	0.812	49	0.451	85	0.681	121	0.458	157	0.734	193	0.922	229	0.998	265	0.926	301	0.984
14	0.806	50	0.447	86	0.684	122	0.452	158	0.744	194	0.925	230	0.997	266	0.925	302	0.986
15	0.799	51	0.443	87	0.687	123	0.448	159	0.753	195	0.929	231	0.996	267	0.924	303	0.988
16	0.792	52	0.440	88	0.689	124	0.445	160	0.762	196	0.932	232	0.995	268	0.924	304	0.990
17	0.784	53	0.439	89	0.690	125	0.443	161	0.770	197	0.935	233	0.994	269	0.923	305	0.992
18	0.776	54	0.439	90	0.690	126	0.442	162	0.778	198	0.938	234	0.993	270	0.923	306	0.993
19	0.768	55	0.440	91	0.690	127	0.442	163	0.786	199	0.942	235	0.991	271	0.923	307	0.995
20	0.759	56	0.442	92	0.689	128	0.443	164	0.794	200	0.945	236	0.989	272	0.924	308	0.996
21	0.750	57	0.446	93	0.687	129	0.446	165	0.801	201	0.948	237	0.988	273	0.924	309	0.997
22	0.741	58	0.450	94	0.684	130	0.450	166	0.808	202	0.952	238	0.986	274	0.925	310	0.998
23	0.731	59	0.456	95	0.681	131	0.455	167	0.814	203	0.955	239	0.984	275	0.925	311	0.999
24	0.721	60	0.462	96	0.677	132	0.461	168	0.820	204	0.958	240	0.981	276	0.926	312	0.999
25	0.711	61	0.470	97	0.672	133	0.468	169	0.826	205	0.961	241	0.979	277	0.928	313	1.000
26	0.700	62	0.478	98	0.666	134	0.476	170	0.832	206	0.964	242	0.977	278	0.929	314	1.000
27	0.689	63	0.487	99	0.660	135	0.484	171	0.837	207	0.967	243	0.974	279	0.931	315	1.000
28	0.678	64	0.496	100	0.654	136	0.494	172	0.843	208	0.970	244	0.972	280	0.932	316	1.000
29	0.667	65	0.506	101	0.646	137	0.504	173	0.848	209	0.973	245	0.969	281	0.934	317	0.999
30	0.655	66	0.516	102	0.638	138	0.514	174	0.852	210	0.975	246	0.966	282	0.936	318	0.999
31	0.643	67	0.527	103	0.630	139	0.525	175	0.857	211	0.978	247	0.964	283	0.938	319	0.998
32	0.631	68	0.538	104	0.621	140	0.537	176	0.861	212	0.980	248	0.961	284	0.940	320	0.997
33	0.619	69	0.548	105	0.611	141	0.549	177	0.866	213	0.983	249	0.958	285	0.943	321	0.996
34	0.607	70	0.559	106	0.602	142	0.561	178	0.870	214	0.985	250	0.956	286	0.945	322	0.994
35	0.594	71	0.570	107	0.591	143	0.573	179	0.874	215	0.987	251	0.953	287	0.948	323	0.993



Figure 1
Auxiliary Antenna Azimuthal Pattern
WMOR-TV Lakeland, FL
Facility ID 53819
Ch. 18 841 kW 394 m

prepared for
Hearst Properties Inc.

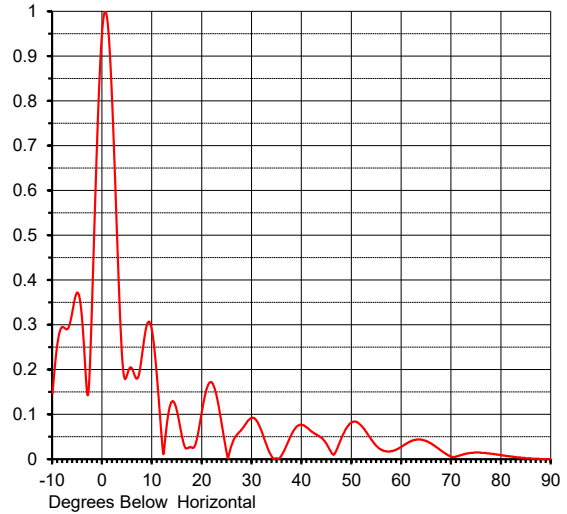
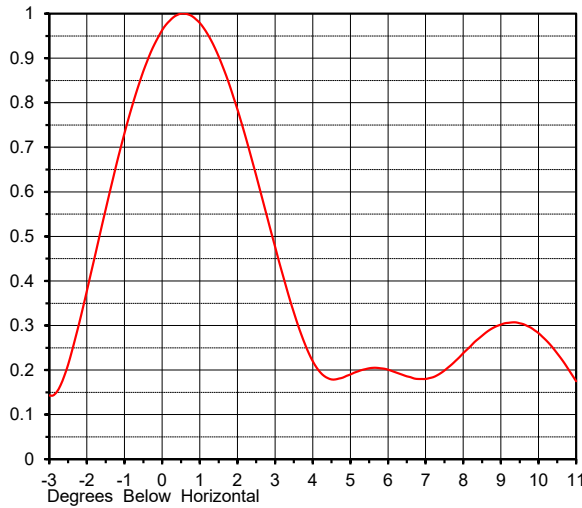
December, 2019

ELEVATION PATTERN

Proposal No. **C-71170-1**
 Date **28-Jun-18**
 Call Letters **WMOR**
 Channel **18**
 Frequency **497 MHz**
 Antenna Type **TFU-16WB C160**

RMS Directivity at Main Lobe **14.1 (11.48 dB)**
 RMS Directivity at Horizontal **13.0 (11.14 dB)**
Calculated

Beam Tilt **0.55 deg**
 Pattern Number **16W141055**



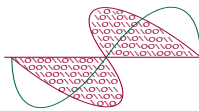
Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.147	10.0	0.283	30.0	0.092	50.0	0.082	70.0	0.005
-9.0	0.260	11.0	0.175	31.0	0.084	51.0	0.083	71.0	0.006
-8.0	0.295	12.0	0.033	32.0	0.060	52.0	0.074	72.0	0.009
-7.0	0.291	13.0	0.085	33.0	0.029	53.0	0.059	73.0	0.012
-6.0	0.331	14.0	0.129	34.0	0.005	54.0	0.043	74.0	0.014
-5.0	0.372	15.0	0.105	35.0	0.002	55.0	0.029	75.0	0.015
-4.0	0.301	16.0	0.049	36.0	0.010	56.0	0.021	76.0	0.014
-3.0	0.143	17.0	0.024	37.0	0.033	57.0	0.017	77.0	0.013
-2.0	0.378	18.0	0.026	38.0	0.057	58.0	0.018	78.0	0.012
-1.0	0.732	19.0	0.048	39.0	0.073	59.0	0.022	79.0	0.011
0.0	0.963	20.0	0.110	40.0	0.077	60.0	0.028	80.0	0.009
1.0	0.979	21.0	0.160	41.0	0.071	61.0	0.035	81.0	0.007
2.0	0.785	22.0	0.170	42.0	0.061	62.0	0.041	82.0	0.006
3.0	0.477	23.0	0.136	43.0	0.054	63.0	0.044	83.0	0.004
4.0	0.220	24.0	0.073	44.0	0.047	64.0	0.043	84.0	0.003
5.0	0.190	25.0	0.010	45.0	0.033	65.0	0.040	85.0	0.002
6.0	0.201	26.0	0.034	46.0	0.013	66.0	0.034	86.0	0.001
7.0	0.180	27.0	0.055	47.0	0.022	67.0	0.027	87.0	0.001
8.0	0.238	28.0	0.067	48.0	0.049	68.0	0.019	88.0	0.000
9.0	0.302	29.0	0.083	49.0	0.070	69.0	0.011	89.0	0.000
								90.0	0.000



Figure 2
Auxiliary Antenna Elevation Pattern
WMOR-TV Lakeland, FL
Facility ID 53819
Ch. 18 841 kW 394 m

prepared for
Hearst Properties Inc.

December, 2019



Chesapeake RF Consultants, LLC
Radiofrequency Consulting Engineers
Digital Television and Radio

Figure 3
Proposed Auxiliary Contours
WMOR-TV Lakeland, FL
Facility ID 53819
Ch. 18 841 kW 394 m

prepared for
Hearst Properties Inc.

December, 2019

Ch. 18 Construction Permit
File# 0000064337
1000 kW 459 m nondirectional
41 dBu Contour

Proposed Auxiliary Ch. 18
841 kW 394 m directional
48 dBu
(Principal Community)
41 dBu
(Noise Limited Service Contour)

