

## **Technical Report WMAF(AM) New 223D**

This technical report is submitted for an amendment to the pending application for a new fill-in translator at channel 223, FCC file no. BNPFT-20180418AFD, to serve as a fill-in facility to rebroadcast WMAF(AM) 1230 kHz at Madison, FL, FCC facility I.D. no. 5329. A change in antenna is submitted.

### **New 223D Translator Analysis:**

An overlap study in exhibit E-1 shows the new 223D translator is within the second adjacent WAAC(FM) 225C1 protected contour. A tabulation of the 111.02 +40 dBu F(50-10) contour within WAAC(FM) (exhibit E-2) using the vertical elevation pattern of the ERI 1105 three bay, 1.0 wavelength spaced antenna (exhibit E-3) shows the interfering contour will not reach any population, major roads or occupied buildings from a distance of 70 meters from the base of the tower, as shown in the aerial photo (exhibit E-4). Based on this showing, a waiver of Section 74.1204 is requested, in accordance with *Living Way Ministries, Inc.* (FCC 08-242). The 60 dBu F(50-50) contour is contained within the WMAF(AM) 2.0 mV/m daytime contour (exhibit E-5).

### **Antenna System:**

The new 223D translator is to be located on the existing 60 meter tower at coordinates:

**30 28 23N 83 26 09W NAD 27.**

A TOWAIR determination is included as exhibit E-6. An ERI 1105 three bay, 1.0 wavelength-spaced, nondirectional antenna will be mounted at a COR AGL of 56 meters, 90 meters AMSL and operate at 0.250 kW ERP.

**RF Exposure Calculation:**

The RF contribution was calculated using the formula from the OET Bulletin 65:

$$S \text{ (RF in microwatts/cm}^2\text{)} = \frac{33.4 \times F^2 \times (H \text{ ERP} + V \text{ ERP in watts})}{R^2 \text{ (height of radiation center in meters}^2\text{)}}$$

Using a worst case vertical (F) factor of 1.0, the RF is calculated to be 5.73  $\mu\text{W}/\text{cm}^2$  to the ground, which is well below 5% of the 200  $\mu\text{W}/\text{cm}^2$  maximum permissible for general public exposure allowing exclusion from consideration.

**Conclusion:**

It is concluded that the amendment application for a new 223D translator facility for WMAF(AM) complies with all Commission rules and policies.



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# E-1 WMAF(AM) New 223D.AP Mod. Overlap Study

REFERENCE 30 28 23.0 N. 83 26 09.0 W.		CH# 223D - 92.5 MHz, Pwr= 0.25 kW, HAAT= 57.3 M, COR= 90 M Average Protected F(50-50)= 9.96 km Omni-directional								DISPLAY DATES DATA 05-01-18 SEARCH 05-01-18		
CH CITY	CALL	TYPE STATE	ANT AZI <--	DI ST FILE #	LAT LNG	PWR(kW) HAAT(M)	INT(km) COR(M)	PRO(km) LICENSEE	*IN* (Overlap in km)	*OUT*		
223D Madi son	1776765	APP _C_ FL	0.0 0.0	0.00 BNPFT20180130AHD	30 28 23.0 83 26 09.0	0.250	90	---Reference--- Geneva Wal ker				
223D Madi son	1781696	APP _C_ FL	0.0 0.0	0.00 BNPFT20180418AFD	30 28 23.0 83 26 09.0	0.250	33.6 90	10.0 Geneva Wal ker	-43.6*	-43.6*		
225C1 Val dosta	WAAC	LIC _CN GA	11.8 191.8	37.54 BLH19860903KD	30 48 13.0 83 21 20.0	100.000 153	7.4 207	59.8 W.g.o.v., Inc.	20.4	-23.4* <b>(1)</b>		
223C3 Ti fton	WKZZ	LIC _C_ GA	4.7 184.8	117.66 BLH19990913AAW	31 31 40.0 83 20 01.0	20.500 110	111.2 196	39.4 Broadcast South, LI c	-3.5	45.2		
221A Perry	WNFK	LIC _CX FL	187.7 7.7	43.19 BLH20160708AAN	30 05 17.0 83 29 46.0	6.000 89	2.6 109	26.8 Docki ns Communi cations, In	30.4	15.3		
223C1 Panama Ci ty	WPAP	LIC _CX FL	271.8 90.7	196.65 BLH20130802ABG	30 30 42.0 85 29 17.2	100.000 280	169.4 324	70.2 Clear Chan. B/casting Li ce	16.8	91.4		
220C3 Monticello	WKVH«	LIC ZCX FL	294.5 114.3	53.12 BLED20050802ABW	30 40 13.0 83 56 26.0	1.500 403	1.4 451	28.5 Educational Media Foundati	40.5R	12.6M		
223A Al achua	WNDT	LIC _CN FL	128.7 309.2	129.81 BLH19960815KB	29 44 22.0 82 23 09.0	3.200 135	82.9 172	28.1 Ocal a Broadcasting Corpora	36.3	65.7		
222L1 Whi te Springs	WSSJ-LP	LIC ____ FL	100.8 281.2	63.40 BLL20150727ACS	30 21 51.0 82 47 12.0	0.036 49	77	44.0 Whi te Springs Public Radi o		42.5		
221A Adel	WDDQ	LIC _CX GA	3.0 183.1	73.97 BLH20111102ACH	31 08 15.0 83 23 41.0	2.600 154	2.5 225	27.8 Small town Broadcasting, LI	61.5	45.0		
222A Mei gs	WQLI	LIC _CX GA	313.2 132.8	100.10 BLH20030721AAA	31 05 12.0 84 12 10.0	6.000 100	42.2 175	27.0 Flint Media, Inc.	48.6	59.7		
222A Mei gs	AL7159	RSV-A ____ GA	313.2 132.8	100.10 RM10608	31 05 12.0 84 12 10.0	6.000 100	42.1 175	27.0	48.7	59.7		

Terrain database is FCC NGDC 30 Sec , R= 73.215 qualifying spacings or FCC minimum Spacings in KM, M= Margin in KM  
In & Out distances between contours are shown at closest points. Reference zone= East Zone, Co to 3rd adjacent.  
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

- (1) The +40 111.02 F(50-10) dBu contour within the second-adjacent WAAC(FM) 225C1 protected contour (exhibit E-2) does not encompass any population, roads or occupied buildings, as shown in the aerial photo in exhibit E-4.

E-2 New 223D.AP Mod. +40 dBu Tabulation Within WAAC(FM) 225C1

New 223D Madison, FL, Showing Protection to WAAC  
Geographic Coordinates: N.30 28 23.00 W.83 26 09.00  
74.1204(d) Study - Using FCC 30 SEC Terrain Database  
Translator or LPFM Maximum Licensed ERP = 0.25  
Translator or LPFM Antenna Height AG = 56 Meters New  
223D Antenna Model = ERI 1105-3F

Protected Station's Contour = 71.01558 dBu  
Translator's or LPFM's full Interference contour 111.01558

Review Azimuth = 0 Degrees True  
Relative Field on the horizon at Review Azimuth = 1.000  
Translator/LPFM ERP on the horizon at Review Azimuth = 0.25 kW  
Distance between stations = 37.5 km  
Protected Station= WAAC, 100 kW, 207 M Meters COR AMSL

Depression Angle From Horizon(Deg)	Vertical Relative Field	Horizontal Relative Field	ERP (kw)	Dist to IX Contour Along Dep. Angle (m)	Dist to IX Contour From Tower Base (m)	Height IX Above Ground (m) (1)
00.00	1.0	1.0	0.2500	312.0262	312.0262	056.000
01.00	0.996	1.0	0.2480	310.7781	310.7307	050.576
02.00	0.984	1.0	0.2421	307.0337	306.8467	045.285
03.00	0.963	1.0	0.2318	300.4812	300.0694	040.274
04.00	0.935	1.0	0.2186	291.7445	291.0338	035.649
05.00	0.9	1.0	0.2025	280.8235	279.7549	031.525
06.00	0.858	1.0	0.1840	267.7184	266.2518	028.016
07.00	0.81	1.0	0.1640	252.7412	250.8573	025.199
08.00	0.756	1.0	0.1429	235.8918	233.5961	023.170
09.00	0.698	1.0	0.1218	217.7943	215.1129	021.929
10.00	0.635	1.0	0.1008	198.1366	195.1265	021.594
11.00	0.569	1.0	0.0809	177.5429	174.2809	022.123
12.00	0.501	1.0	0.0628	156.3251	152.9090	023.498
13.00	0.432	1.0	0.0467	134.7953	131.3405	025.678
14.00	0.362	1.0	0.0328	112.9535	109.5983	028.674
15.00	0.292	1.0	0.0213	091.1116	088.0071	032.419
16.00	0.223	1.0	0.0124	069.5818	066.8864	036.821
17.00	0.156	1.0	0.0061	048.6761	046.5492	041.768
18.00	0.092	1.0	0.0021	028.7064	027.3014	047.129
19.00	0.032	1.0	0.0003	009.9848	009.4408	052.749
20.00	0.025	1.0	0.0002	007.8007	007.3302	053.332
21.00	0.077	1.0	0.0015	024.0260	022.4302	047.390
22.00	0.124	1.0	0.0038	038.6912	035.8739	041.506
23.00	0.166	1.0	0.0069	051.7963	047.6788	035.762
24.00	0.202	1.0	0.0102	063.0293	057.5801	030.364
25.00	0.232	1.0	0.0135	072.3901	065.6077	025.407
26.00	0.256	1.0	0.0164	079.8787	071.7945	020.983
27.00	0.275	1.0	0.0189	085.8072	076.4548	017.044
28.00	0.287	1.0	0.0206	089.5515	079.0693	013.958
29.00	0.293	1.0	0.0215	091.4237	079.9609	011.677
30.00	0.294	1.0	0.0216	091.7357	079.4454	010.132
31.00	0.29	1.0	0.0210	090.4876	077.5630	009.395
32.00	0.28	1.0	0.0196	087.3673	074.0917	009.702
33.00	0.266	1.0	0.0177	082.9990	069.6088	010.796
34.00	0.248	1.0	0.0154	077.3825	064.1530	012.728
35.00	0.225	1.0	0.0127	070.2059	057.5093	015.732
36.00	0.2	1.0	0.0100	062.4052	050.4869	019.319
37.00	0.171	1.0	0.0073	053.3565	042.6124	023.889
38.00	0.14	1.0	0.0049	043.6837	034.4232	029.106
39.00	0.107	1.0	0.0029	033.3868	025.9464	034.989
40.00	0.072	1.0	0.0013	022.4659	017.2099	041.559
41.00	0.037	1.0	0.0003	011.5450	008.7131	048.426
42.00	0.001	1.0	0.0000	000.3120	000.2319	055.791
43.00	0.036	1.0	0.0003	011.2329	008.2153	048.339
44.00	0.072	1.0	0.0013	022.4659	016.1606	040.394
45.00	0.107	1.0	0.0029	033.3868	023.6080	032.392
46.00	0.142	1.0	0.0050	044.3077	030.7787	024.128
47.00	0.176	1.0	0.0077	054.9166	037.4530	015.837
48.00	0.208	1.0	0.0108	064.9014	043.4275	007.769
49.00	0.238	1.0	0.0142	074.2622	048.7204	-000.046
50.00	0.267	1.0	0.0178	083.3110	053.5513	-007.820
51.00	0.293	1.0	0.0215	091.4237	057.5348	-015.050
52.00	0.318	1.0	0.0253	099.2243	061.0886	-022.190
53.00	0.34	1.0	0.0289	106.0889	063.8459	-028.726
54.00	0.36	1.0	0.0324	112.3294	066.0256	-034.876
55.00	0.377	1.0	0.0355	117.6339	067.4720	-040.360
56.00	0.393	1.0	0.0386	122.6263	068.5717	-045.662
57.00	0.406	1.0	0.0412	126.6826	068.9963	-050.245 (1)
58.00	0.416	1.0	0.0433	129.8029	068.7850	-054.079
59.00	0.425	1.0	0.0452	132.6111	068.2998	-057.670
60.00	0.432	1.0	0.0467	134.7953	067.3977	-060.736

(1) The +40 111.02 F(50-10) dBu contour does not encompass any population, roads or occupied buildings from a distance of 70 meters from the tower where the interfering contour does reach the ground, as shown in the aerial photo in exhibit E-4.

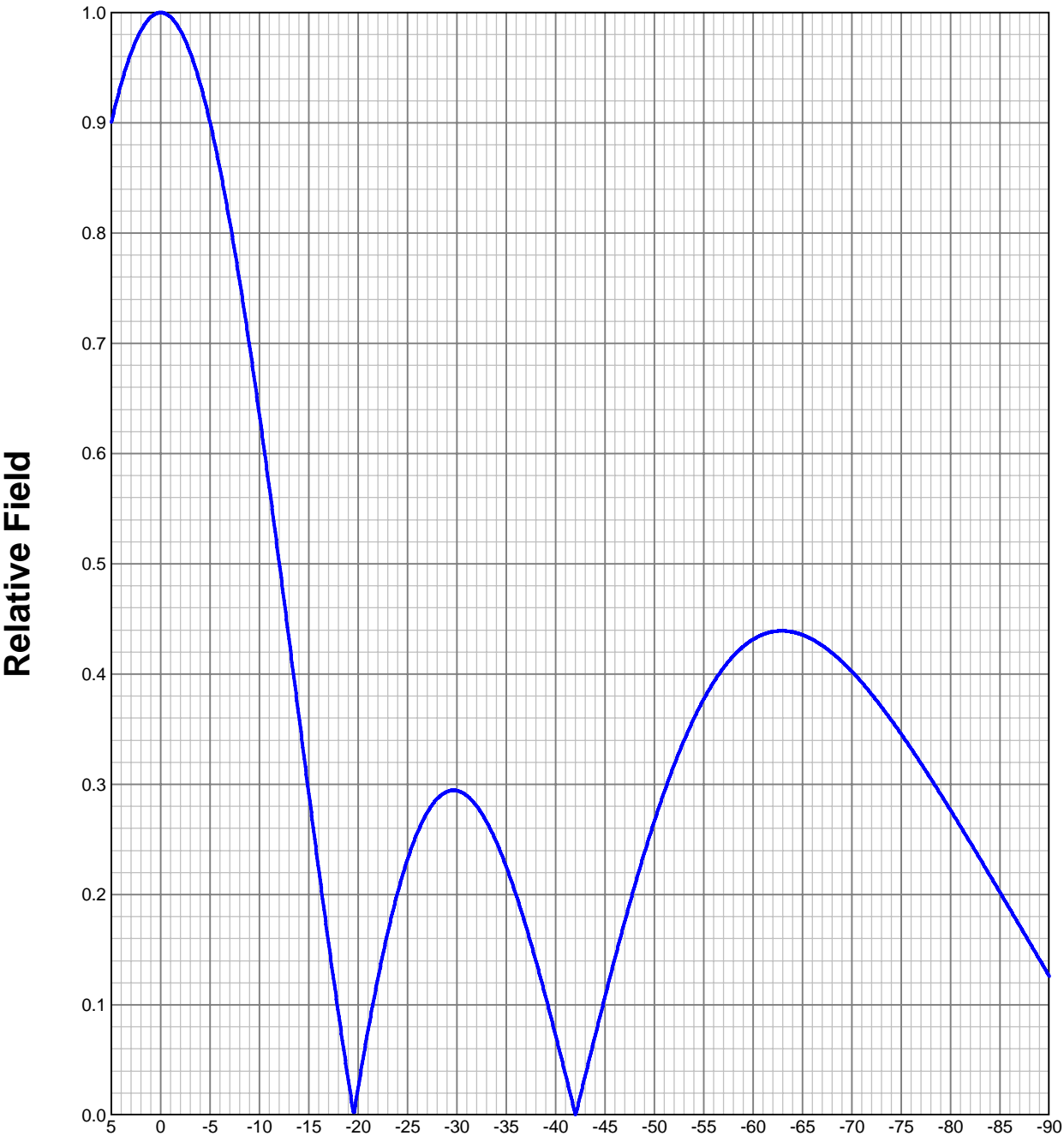
E-2 New 223D.AP Mod. +40 dBu Tabulation Within WAAC(FM) 225C1, cont.

Depression Angle From Horizon(Deg)	Vertical Relative Field	Horizontal Relative Field	ERP (kw)	Dist to IX Contour Along Dep. Angle (m)	Dist to IX Contour From Tower Base (m)	Height IX Above Ground (m) (1)
61.00	0.436	1.0	0.0475	136.0434	065.9551	-062.986
62.00	0.439	1.0	0.0482	136.9795	064.3080	-064.946
63.00	0.439	1.0	0.0482	136.9795	062.1874	-066.050
64.00	0.438	1.0	0.0480	136.6675	059.9111	-066.836
65.00	0.436	1.0	0.0475	136.0434	057.4944	-067.297
66.00	0.431	1.0	0.0464	134.4833	054.6993	-066.857
67.00	0.426	1.0	0.0454	132.9231	051.9372	-066.356
68.00	0.419	1.0	0.0439	130.7390	048.9757	-065.219
69.00	0.411	1.0	0.0422	128.2428	045.9581	-063.725
70.00	0.402	1.0	0.0404	125.4345	042.9011	-061.870
71.00	0.392	1.0	0.0384	122.3143	039.8216	-059.650
72.00	0.382	1.0	0.0365	119.1940	036.8330	-057.360
73.00	0.37	1.0	0.0342	115.4497	033.7542	-054.405
74.00	0.358	1.0	0.0320	111.7054	030.7902	-051.378
75.00	0.346	1.0	0.0299	107.9610	027.9424	-048.282
76.00	0.332	1.0	0.0276	103.5927	025.0613	-044.516
77.00	0.319	1.0	0.0254	099.5363	022.3908	-040.985
78.00	0.305	1.0	0.0233	095.1680	019.7865	-037.088
79.00	0.291	1.0	0.0212	090.7996	017.3254	-033.131
80.00	0.276	1.0	0.0190	086.1192	014.9544	-028.811
81.00	0.262	1.0	0.0172	081.7509	012.7887	-024.744
82.00	0.247	1.0	0.0153	077.0705	010.7261	-020.320
83.00	0.232	1.0	0.0135	072.3901	008.8221	-015.850
84.00	0.217	1.0	0.0118	067.7097	007.0776	-011.339
85.00	0.202	1.0	0.0102	063.0293	005.4934	-006.789
86.00	0.187	1.0	0.0087	058.3489	004.0702	-002.207
87.00	0.172	1.0	0.0074	053.6685	002.8088	002.405
88.00	0.156	1.0	0.0061	048.6761	001.6988	007.354
89.00	0.141	1.0	0.0050	043.9957	000.7678	012.011
90.00	0.126	1.0	0.0040	039.3153	000.0000	016.685

(1) The +40 111.02 F(50-10) dBu contour does not encompass any population, roads or occupied buildings from a distance of 70 meters from the tower where the interfering contour does reach the ground, as shown in the aerial photo in exhibit E-4.

**ELEVATION PATTERN**

Type:	11053F		Channel:	223
Directivity:	Numeric	dBd	Location:	
Main Lobe:	1.56	1.93	Beam Tilt:	0.00
Horizontal:	1.56	1.93	Polarization:	Circular



Preliminary, subject to final design and review.

## TABULATED DATA FOR ELEVATION PATTERN

Type: 11053F

Polarization: Circular

ANGLE FIELD	dB	ANGLE FIELD	dB	ANGLE FIELD	dB	ANGLE FIELD	dB	ANGLE FIELD	dB
5.00	0.900	-0.91	-6.75	0.823	-1.70	-27.00	0.275	-11.23	-50.50
4.75	0.910	-0.82	-7.00	0.810	-1.83	-27.50	0.281	-11.01	-51.00
4.50	0.919	-0.74	-7.25	0.797	-1.97	-28.00	0.287	-10.85	-51.50
4.25	0.927	-0.66	-7.50	0.784	-2.12	-28.50	0.291	-10.73	-52.00
4.00	0.935	-0.58	-7.75	0.770	-2.27	-29.00	0.293	-10.65	-52.50
3.75	0.943	-0.51	-8.00	0.756	-2.43	-29.50	0.295	-10.62	-53.00
3.50	0.950	-0.44	-8.25	0.742	-2.59	-30.00	0.294	-10.63	-53.50
3.25	0.957	-0.38	-8.50	0.728	-2.76	-30.50	0.293	-10.67	-54.00
3.00	0.963	-0.32	-8.75	0.713	-2.94	-31.00	0.290	-10.76	-54.50
2.75	0.969	-0.27	-9.00	0.698	-3.13	-31.50	0.286	-10.88	-55.00
2.50	0.975	-0.22	-9.25	0.682	-3.32	-32.00	0.280	-11.05	-55.50
2.25	0.979	-0.18	-9.50	0.667	-3.52	-32.50	0.274	-11.25	-56.00
2.00	0.984	-0.14	-9.75	0.651	-3.73	-33.00	0.266	-11.50	-56.50
1.75	0.987	-0.11	-10.00	0.635	-3.94	-33.50	0.257	-11.79	-57.00
1.50	0.991	-0.08	-10.50	0.603	-4.40	-34.00	0.248	-12.12	-57.50
1.25	0.994	-0.06	-11.00	0.569	-4.89	-34.50	0.237	-12.51	-58.00
1.00	0.996	-0.04	-11.50	0.535	-5.43	-35.00	0.225	-12.95	-58.50
0.75	0.998	-0.02	-12.00	0.501	-6.00	-35.50	0.213	-13.44	-59.00
0.50	0.999	-0.01	-12.50	0.467	-6.62	-36.00	0.200	-14.00	-59.50
0.25	1.000	0.00	-13.00	0.432	-7.30	-36.50	0.186	-14.63	-60.00
0.00	1.000	0.00	-13.50	0.397	-8.03	-37.00	0.171	-15.34	-60.50
-0.25	1.000	0.00	-14.00	0.362	-8.84	-37.50	0.156	-16.15	-61.00
-0.50	0.999	-0.01	-14.50	0.327	-9.72	-38.00	0.140	-17.08	-61.50
-0.75	0.998	-0.02	-15.00	0.292	-10.70	-38.50	0.124	-18.16	-62.00
-1.00	0.996	-0.04	-15.50	0.257	-11.79	-39.00	0.107	-19.42	-62.50
-1.25	0.994	-0.06	-16.00	0.223	-13.03	-39.50	0.090	-20.94	-63.00
-1.50	0.991	-0.08	-16.50	0.190	-14.45	-40.00	0.072	-22.81	-63.50
-1.75	0.987	-0.11	-17.00	0.156	-16.11	-40.50	0.055	-25.25	-64.00
-2.00	0.984	-0.14	-17.50	0.124	-18.13	-41.00	0.037	-28.69	-64.50
-2.25	0.979	-0.18	-18.00	0.092	-20.68	-41.50	0.019	-34.55	-65.00
-2.50	0.975	-0.22	-18.50	0.062	-24.20	-42.00	0.001	-64.47	-65.50
-2.75	0.969	-0.27	-19.00	0.032	-29.94	-42.50	0.018	-35.10	-66.00
-3.00	0.963	-0.32	-19.50	0.003	-50.53	-43.00	0.036	-28.93	-66.50
-3.25	0.957	-0.38	-20.00	0.025	-32.11	-43.50	0.054	-25.37	-67.00
-3.50	0.950	-0.44	-20.50	0.051	-25.77	-44.00	0.072	-22.87	-67.50
-3.75	0.943	-0.51	-21.00	0.077	-22.28	-44.50	0.090	-20.94	-68.00
-4.00	0.935	-0.58	-21.50	0.101	-19.90	-45.00	0.107	-19.37	-68.50
-4.25	0.927	-0.66	-22.00	0.124	-18.13	-45.50	0.125	-18.07	-69.00
-4.50	0.919	-0.74	-22.50	0.146	-16.74	-46.00	0.142	-16.95	-69.50
-4.75	0.910	-0.82	-23.00	0.166	-15.61	-46.50	0.159	-15.97	-70.00
-5.00	0.900	-0.91	-23.50	0.184	-14.68	-47.00	0.176	-15.11	-70.50
-5.25	0.890	-1.01	-24.00	0.202	-13.90	-47.50	0.192	-14.34	-71.00
-5.50	0.880	-1.11	-24.50	0.218	-13.24	-48.00	0.208	-13.65	-71.50
-5.75	0.869	-1.22	-25.00	0.232	-12.69	-48.50	0.223	-13.03	-72.00
-6.00	0.858	-1.33	-25.50	0.245	-12.22	-49.00	0.238	-12.47	-72.50
-6.25	0.847	-1.44	-26.00	0.256	-11.83	-49.50	0.253	-11.95	-73.00
-6.50	0.835	-1.57	-26.50	0.266	-11.50	-50.00	0.267	-11.48	-73.50

*Preliminary, subject to final design and review.*

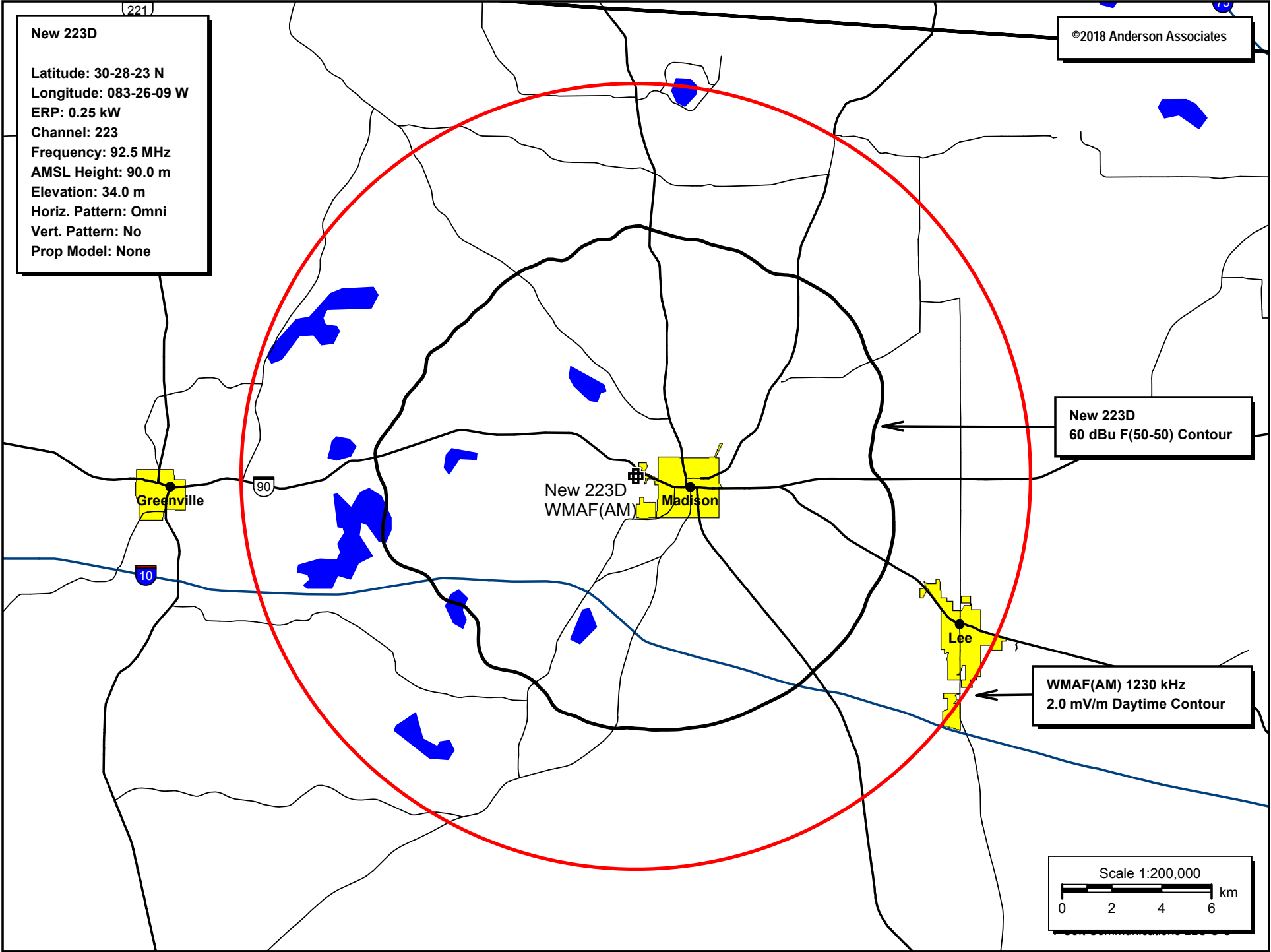


E-4 New 223D +40 110.8 F(50-10) dBu Contour Aerial Photo





E-5 New 223D.AP Mod. 60 dBu Contour Plot



## TOWAIR Determination Results

### \*\*\* NOTICE \*\*\*

TOWAIR's findings are not definitive or binding, and we cannot guarantee that the data in TOWAIR are fully current and accurate. In some instances, TOWAIR may yield results that differ from application of the criteria set out in 47 C.F.R. Section 17.7 and 14 C.F.R. Section 77.13. A positive finding by TOWAIR recommending notification should be given considerable weight. On the other hand, a finding by TOWAIR recommending either for or against notification is not conclusive. It is the responsibility of each ASR participant to exercise due diligence to determine if it must coordinate its structure with the FAA. TOWAIR is only one tool designed to assist ASR participants in exercising this due diligence, and further investigation may be necessary to determine if FAA coordination is appropriate.

#### DETERMINATION Results

**Structure does not require registration. There are no airports within 8 kilometers (5 miles) of the coordinates you provided.**

#### Your Specifications

##### NAD83 Coordinates

Latitude	30-28-24.0 north
Longitude	083-26-09.0 west

##### Measurements (Meters)

Overall Structure Height (AGL)	60
Support Structure Height (AGL)	0
Site Elevation (AMSL)	34

##### Structure Type

GTOWER - Guyed Structure Used for Communication Purposes