

Technical Report WMAF(AM) New 223D

This technical report is submitted for a new fill-in translator at channel 223 to serve as a fill-in facility to rebroadcast WMAF(AM) 1230 kHz at Madison, FL, FCC facility I.D. no. 5329.

New 223D Translator Analysis:

An overlap study in exhibit E-1 shows the new 223D translator is 23.2 km 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 Nicom BKG77 three bay, 0.85 wavelength spaced antenna (exhibit E-3) shows the interfering contour will not reach any population, major roads or buildings from a distance of 50 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. A Nicom BKG77 three bay, 0.85 wavelength-spaced, non-directional antenna will be mounted at a COR AGL of 56 meters, 90 meters AMSL and operate at 0.250 kW ERP.

RF Exposure Calculation:

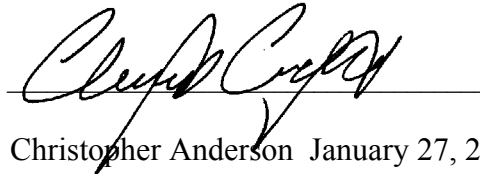
The RF contribution was calculated using the formula from the OET Bulletin 65:

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

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 application for a new 223D translator facility for WMAF(AM) complies with all Commission rules and policies.



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E-1 New 223D Overlap Study

REFERENCE		CH# 223D - 92.5 MHz, Pwr= 0.25 kW, HAAT= 56.0 M, COR= 90 M								DISPLAY DATES	
30 28 23.0 N.		Average Protected F(50-50)= 9.85 km								DATA 01-31-18	
83 26 09.0 W.		Omni-directional								SEARCH 01-31-18	
CH CITY	CALL	TYPE STATE	ANT	AZI <--	DIST FILE #	LAT LNG	PWR(kW) HAAT(M)	INT(km) COR(M)	PRO(km) LICENSEE	*IN* (Overlap in km)	*OUT*
225C1 Valdosta	WAAC	LIC _CN GA		11.8 191.8	37.54 BLH19860903KD	30 48 13.0 83 21 20.0	100.000 153	7.3 207	59.6 W.g.o.v., Inc.	20.5	-23.2*(1)
223C3 Tifton	WKZZ	LIC _C_ GA		4.7 184.8	117.66 BLH19990913AAW	31 31 40.0 83 20 01.0	20.500 110	111.4 196	39.7 Broadcast South, LIc	-3.7	45.7
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	26.3 Dockins Communications, In	30.6	15.8
223C1 Panama City	WPAP	LIC _CX FL		271.8 90.7	196.65 BLH20130802ABG	30 30 42.0 85 29 17.2	100.000 280	169.1 324	69.9 Clear Channel Broadcasting	17.2	92.2
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	28.4 Educational Media Foundati	40.5R	12.6M
223A Alachua	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 Ocala Broadcasting Corpora	36.5	66.5
222L1 White Springs	WSSJ-LP	LIC ____ FL		100.8 281.2	63.40 BLL20150727ACS	30 21 51.0 82 47 12.0	0.036 49	77	44.4 White Springs Public Radio		43.0
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 Smalltown Broadcasting, LI	61.6	45.0
222A Meigs	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	27.1 Flint Media, Inc.	48.4	59.6
222A Meigs	AL7159	RSV-A ____ GA		313.2 132.8	100.10 RM10608	31 05 12.0 84 12 10.0	6.000 100	41.4 172	26.6 49.2		60.1

Terrain database is 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 buildings (exhibit E-4).

E-2 New 223D 111.01 +40 dBu Contour Tabulation

New 223D Madison, FL, Showing Protection to WAAC
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 = NICOM BKG77-3-85% spaced.

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	1.00	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	0.985	1.0	0.2426	307.3458	307.1585	045.274
03.00	0.968	1.0	0.2343	302.0413	301.6274	040.192
04.00	0.944	1.0	0.2228	294.5527	293.8352	035.453
05.00	0.913	1.0	0.2084	284.8799	283.7958	031.171
06.00	0.876	1.0	0.1918	273.3349	271.8376	027.429
07.00	0.833	1.0	0.1735	259.9178	257.9804	024.324
08.00	0.786	1.0	0.1544	245.2526	242.8658	021.867
09.00	0.734	1.0	0.1347	229.0272	226.2075	020.172
10.00	0.678	1.0	0.1149	211.5537	208.3398	019.264
11.00	0.616	1.0	0.0949	192.2081	188.6767	019.325
12.00	0.553	1.0	0.0765	172.5505	168.7798	020.125
13.00	0.488	1.0	0.0595	152.2688	148.3661	021.747
14.00	0.422	1.0	0.0445	131.6750	127.7637	024.145
15.00	0.357	1.0	0.0319	111.3933	107.5977	027.169
16.00	0.291	1.0	0.0212	090.7996	087.2822	030.972
17.00	0.227	1.0	0.0129	070.8299	067.7350	035.291
18.00	0.165	1.0	0.0068	051.4843	048.9645	040.090
19.00	0.105	1.0	0.0028	032.7627	030.9778	045.333
20.00	0.049	1.0	0.0006	015.2893	014.3672	050.771
21.00	0.004	1.0	0.0000	001.2481	001.1652	055.553
22.00	0.053	1.0	0.0007	016.5374	015.3332	049.805
23.00	0.097	1.0	0.0024	030.2665	027.8605	044.174
24.00	0.137	1.0	0.0047	042.7476	039.0519	038.613
25.00	0.171	1.0	0.0073	053.3565	048.3574	033.451
26.00	0.201	1.0	0.0101	062.7173	056.3699	028.507
27.00	0.226	1.0	0.0128	070.5179	062.8319	023.986
28.00	0.245	1.0	0.0150	076.4464	067.4982	020.111
29.00	0.26	1.0	0.0169	081.1268	070.9551	016.669
30.00	0.27	1.0	0.0182	084.2471	072.9601	013.876
31.00	0.274	1.0	0.0188	085.4952	073.2837	011.967
32.00	0.274	1.0	0.0188	085.4952	072.5040	010.694
33.00	0.27	1.0	0.0182	084.2471	070.6555	010.116
34.00	0.262	1.0	0.0172	081.7509	067.7745	010.286
35.00	0.25	1.0	0.0156	078.0065	063.8992	011.257
36.00	0.234	1.0	0.0137	073.0141	059.0697	013.083
37.00	0.216	1.0	0.0117	067.3977	053.8262	015.439
38.00	0.195	1.0	0.0095	060.8451	047.9466	018.540
39.00	0.173	1.0	0.0075	053.9805	041.9507	022.029
40.00	0.148	1.0	0.0055	046.1799	035.3758	026.316
41.00	0.123	1.0	0.0038	038.3792	028.9652	030.821
42.00	0.096	1.0	0.0023	029.9545	022.2605	035.957
43.00	0.069	1.0	0.0012	021.5298	015.7459	041.317
44.00	0.042	1.0	0.0004	013.1051	009.4270	046.896
45.00	0.015	1.0	0.0001	004.6804	003.3095	052.690
46.00	0.011	1.0	0.0000	003.4323	002.3843	053.531
47.00	0.036	1.0	0.0003	011.2329	007.6608	047.785
48.00	0.061	1.0	0.0009	019.0336	012.7360	041.855
49.00	0.085	1.0	0.0018	026.5222	017.4001	035.983
50.00	0.107	1.0	0.0029	033.3868	021.4606	030.424
51.00	0.127	1.0	0.0040	039.6273	024.9383	025.204
52.00	0.147	1.0	0.0054	045.8678	028.2391	019.856
53.00	0.164	1.0	0.0067	051.1723	030.7963	015.132
54.00	0.18	1.0	0.0081	056.1647	033.0128	010.562
55.00	0.194	1.0	0.0094	060.5331	034.7203	006.414
56.00	0.207	1.0	0.0107	064.5894	036.1179	002.453
57.00	0.217	1.0	0.0118	067.7097	036.8773	-000.786
58.00	0.226	1.0	0.0128	070.5179	037.3688	-003.803
59.00	0.233	1.0	0.0136	072.7021	037.4443	-006.318
60.00	0.238	1.0	0.0142	074.2622	037.1311	-008.313
61.00	0.242	1.0	0.0146	075.5103	036.6081	-010.043
62.00	0.245	1.0	0.0150	076.4464	035.8894	-011.498
63.00	0.246	1.0	0.0151	076.7584	034.8476	-012.392
64.00	0.245	1.0	0.0150	076.4464	033.5119	-012.710
65.00	0.244	1.0	0.0149	076.1344	032.1758	-013.001
66.00	0.241	1.0	0.0145	075.1983	030.5859	-012.697
67.00	0.237	1.0	0.0140	073.9502	028.8946	-012.072
68.00	0.233	1.0	0.0136	072.7021	027.2347	-011.408

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

E-2 New 223D 111.01 +40 dBu Contour Tabulation, 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)
69.00	0.227	1.0	0.0129	070.8299	025.3832	-010.125
70.00	0.22	1.0	0.0121	068.6458	023.4782	-008.506
71.00	0.214	1.0	0.0114	066.7736	021.7394	-007.136
72.00	0.208	1.0	0.0108	064.9014	020.0556	-005.725
73.00	0.201	1.0	0.0101	062.7173	018.3368	-003.977
74.00	0.193	1.0	0.0093	060.2210	016.5992	-001.888
75.00	0.185	1.0	0.0086	057.7248	014.9403	000.242
76.00	0.178	1.0	0.0079	055.5407	013.4365	002.109
77.00	0.17	1.0	0.0072	053.0444	011.9324	004.315
78.00	0.162	1.0	0.0066	050.5482	010.5096	006.556
79.00	0.154	1.0	0.0059	048.0520	009.1688	008.831
80.00	0.145	1.0	0.0053	045.2438	007.8565	011.444
81.00	0.14	1.0	0.0049	043.6837	006.8336	012.854
82.00	0.135	1.0	0.0046	042.1235	005.8625	014.286
83.00	0.13	1.0	0.0042	040.5634	004.9434	015.739
84.00	0.125	1.0	0.0039	039.0033	004.0770	017.210
85.00	0.119	1.0	0.0035	037.1311	003.2362	019.010
86.00	0.118	1.0	0.0035	036.8191	002.5684	019.271
87.00	0.117	1.0	0.0034	036.5071	001.9106	019.543
88.00	0.116	1.0	0.0034	036.1950	001.2632	019.827
89.00	0.115	1.0	0.0033	035.8830	000.6262	020.122
90.00	0.114	1.0	0.0032	035.5710	000.0000	020.429

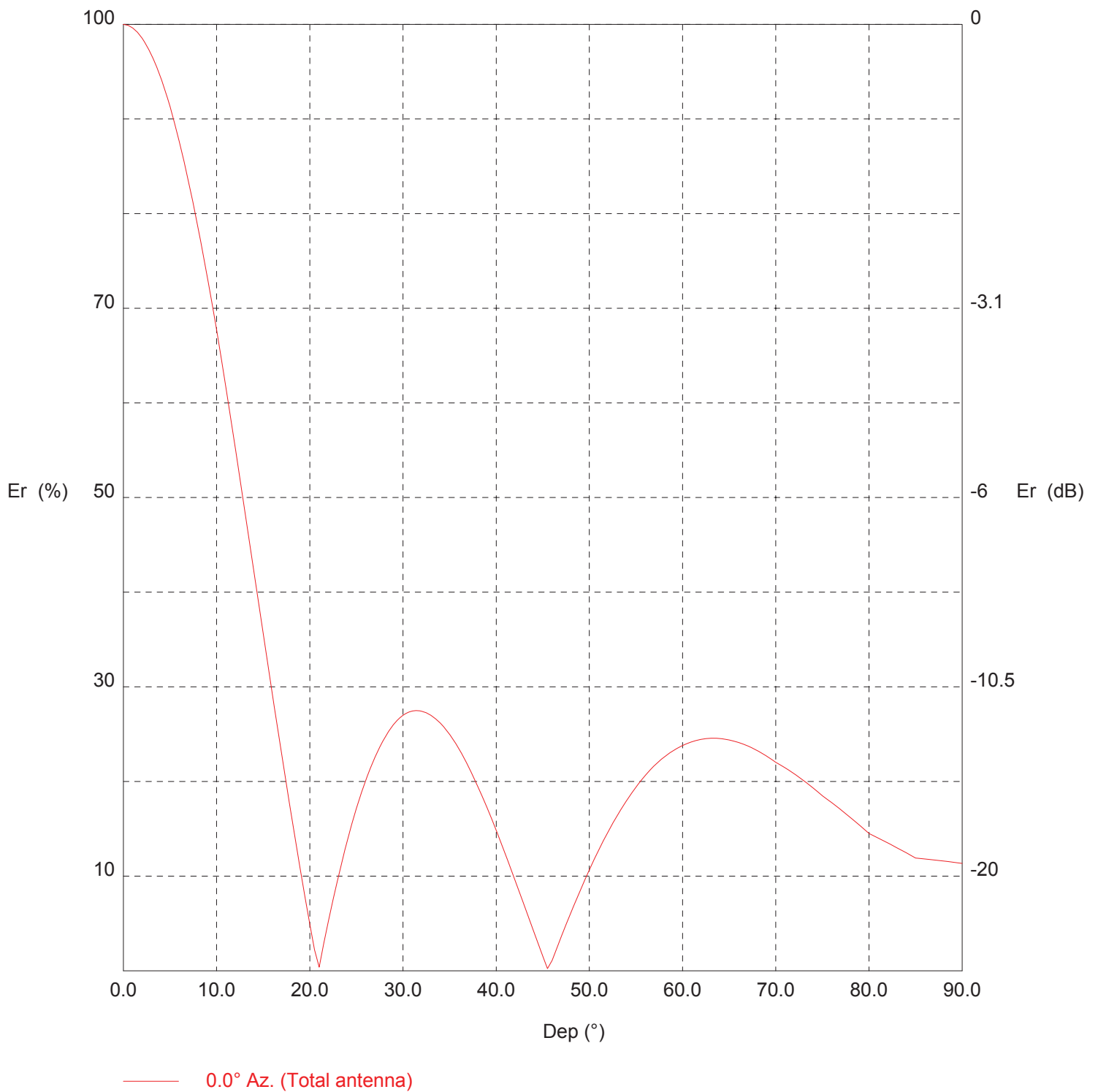
(1) The +40 111.02 F(50-10) dBu contour does not encompass any population, roads or buildings clearing the ground by at 10 from a distance of 50 meters or greater from the tower where there are buildings, as shown in the aerial photo (exhibit E-4).

E-3 New 223D Antenna Elevation Pattern and Tabulation

TX station: BKG77/3 GENERIC

Frequency: 100.00 MHz

Vertical diagram



TX station: BKG77/3 GENERIC

Frequency: 100.00 MHz

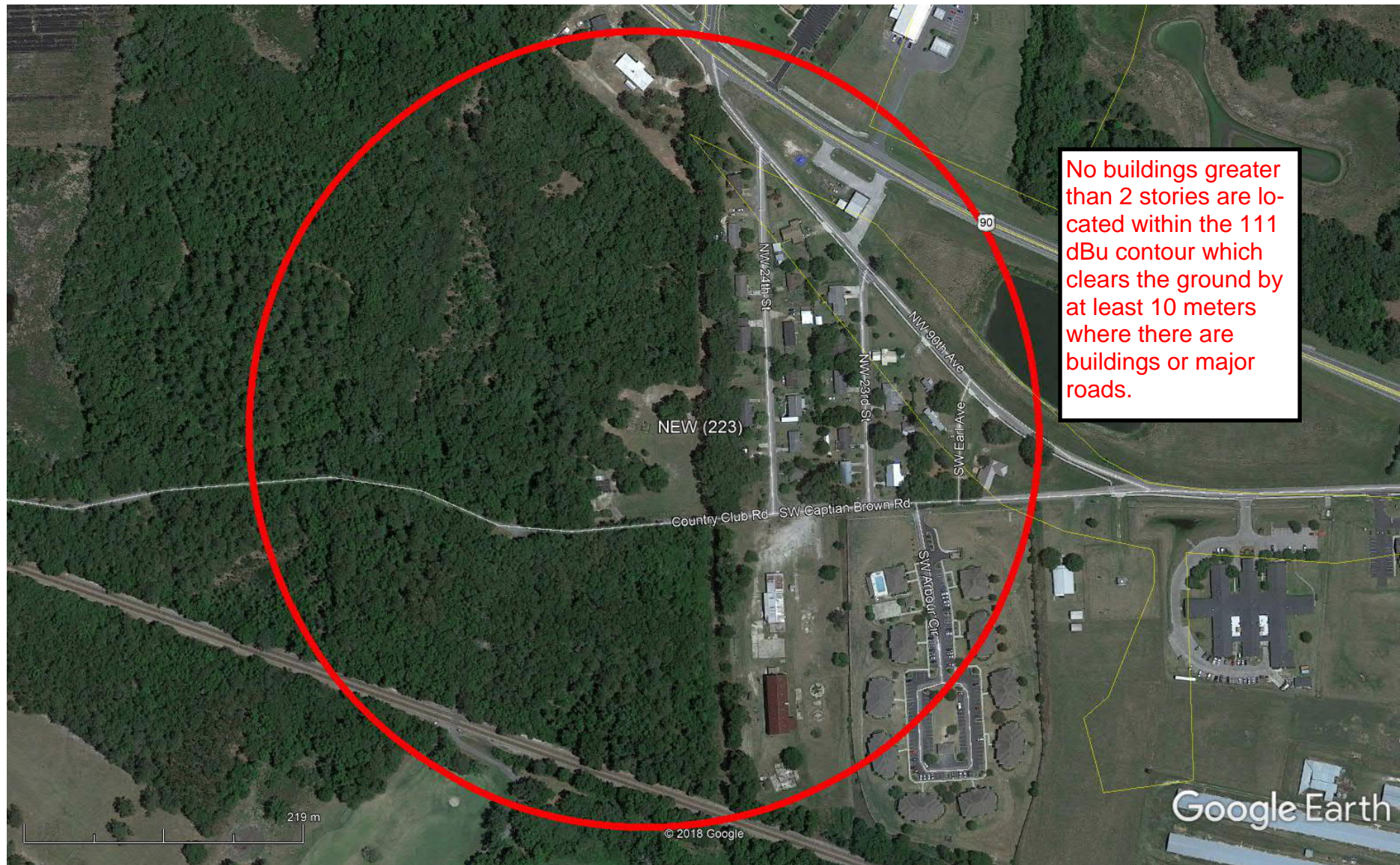
Vertical diagram at an azimuth of 0° degrees

Dep (°)	Er (%)	ERP (KW)	Dep (°)	Er (%)	ERP (KW)	Dep (°)	Er (%)	ERP (KW)
0.0	100.0	1.37	30.0	27.0	0.10	60.0	23.8	0.08
0.5	99.9	1.37	30.5	27.3	0.10	60.5	24.0	0.08
1.0	99.6	1.36	31.0	27.4	0.10	61.0	24.2	0.08
1.5	99.2	1.35	31.5	27.5	0.10	61.5	24.3	0.08
2.0	98.5	1.33	32.0	27.4	0.10	62.0	24.5	0.08
2.5	97.8	1.31	32.5	27.3	0.10	62.5	24.5	0.08
3.0	96.8	1.28	33.0	27.0	0.10	63.0	24.6	0.08
3.5	95.7	1.26	33.5	26.6	0.10	63.5	24.6	0.08
4.0	94.4	1.22	34.0	26.2	0.09	64.0	24.5	0.08
4.5	92.9	1.18	34.5	25.6	0.09	64.5	24.5	0.08
5.0	91.3	1.14	35.0	25.0	0.09	65.0	24.4	0.08
5.5	89.5	1.10	35.5	24.2	0.08	65.5	24.3	0.08
6.0	87.6	1.05	36.0	23.4	0.08	66.0	24.1	0.08
6.5	85.5	1.00	36.5	22.5	0.07	66.5	23.9	0.08
7.0	83.3	0.95	37.0	21.6	0.06	67.0	23.7	0.08
7.5	81.0	0.90	37.5	20.6	0.06	67.5	23.5	0.08
8.0	78.6	0.85	38.0	19.5	0.05	68.0	23.3	0.07
8.5	76.0	0.79	38.5	18.4	0.05	68.5	23.0	0.07
9.0	73.4	0.74	39.0	17.3	0.04	69.0	22.7	0.07
9.5	70.6	0.68	39.5	16.1	0.04	69.5	22.4	0.07
10.0	67.8	0.63	40.0	14.8	0.03	70.0	22.0	0.07
10.5	64.7	0.57	40.5	13.6	0.03	70.5	21.7	0.06
11.0	61.6	0.52	41.0	12.3	0.02	71.0	21.4	0.06
11.5	58.5	0.47	41.5	11.0	0.02	71.5	21.1	0.06
12.0	55.3	0.42	42.0	9.6	0.01	72.0	20.8	0.06
12.5	52.1	0.37	42.5	8.3	0.01	72.5	20.4	0.06
13.0	48.8	0.33	43.0	6.9	0.01	73.0	20.1	0.06
13.5	45.5	0.28	43.5	5.6	0.00	73.5	19.7	0.05
14.0	42.2	0.24	44.0	4.2	0.00	74.0	19.3	0.05
14.5	38.9	0.21	44.5	2.9	0.00	74.5	18.9	0.05
15.0	35.7	0.17	45.0	1.5	0.00	75.0	18.5	0.05
15.5	32.4	0.14	45.5	0.2	0.00	75.5	18.1	0.05
16.0	29.1	0.12	46.0	1.1	0.00	76.0	17.8	0.04
16.5	25.9	0.09	46.5	2.4	0.00	76.5	17.4	0.04
17.0	22.7	0.07	47.0	3.6	0.00	77.0	17.0	0.04
17.5	19.6	0.05	47.5	4.9	0.00	77.5	16.6	0.04
18.0	16.5	0.04	48.0	6.1	0.01	78.0	16.2	0.04
18.5	13.5	0.02	48.5	7.3	0.01	78.5	15.8	0.03
19.0	10.5	0.02	49.0	8.5	0.01	79.0	15.4	0.03
19.5	7.7	0.01	49.5	9.6	0.01	79.5	14.9	0.03
20.0	4.9	0.00	50.0	10.7	0.02	80.0	14.5	0.03
20.5	2.2	0.00	50.5	11.7	0.02	80.5	14.3	0.03
21.0	0.4	0.00	51.0	12.7	0.02	81.0	14.0	0.03
21.5	2.9	0.00	51.5	13.7	0.03	81.5	13.8	0.03
22.0	5.3	0.00	52.0	14.7	0.03	82.0	13.5	0.03
22.5	7.5	0.01	52.5	15.6	0.03	82.5	13.3	0.02
23.0	9.7	0.01	53.0	16.4	0.04	83.0	13.0	0.02
23.5	11.7	0.02	53.5	17.2	0.04	83.5	12.7	0.02
24.0	13.7	0.03	54.0	18.0	0.04	84.0	12.5	0.02
24.5	15.5	0.03	54.5	18.7	0.05	84.5	12.2	0.02
25.0	17.1	0.04	55.0	19.4	0.05	85.0	11.9	0.02
25.5	18.7	0.05	55.5	20.1	0.06	85.5	11.9	0.02
26.0	20.1	0.06	56.0	20.7	0.06	86.0	11.8	0.02
26.5	21.4	0.06	56.5	21.2	0.06	86.5	11.8	0.02
27.0	22.6	0.07	57.0	21.7	0.06	87.0	11.7	0.02
27.5	23.6	0.08	57.5	22.2	0.07	87.5	11.6	0.02
28.0	24.5	0.08	58.0	22.6	0.07	88.0	11.6	0.02
28.5	25.3	0.09	58.5	22.9	0.07	88.5	11.5	0.02
29.0	26.0	0.09	59.0	23.3	0.07	89.0	11.5	0.02
29.5	26.6	0.10	59.5	23.5	0.08	89.5	11.4	0.02

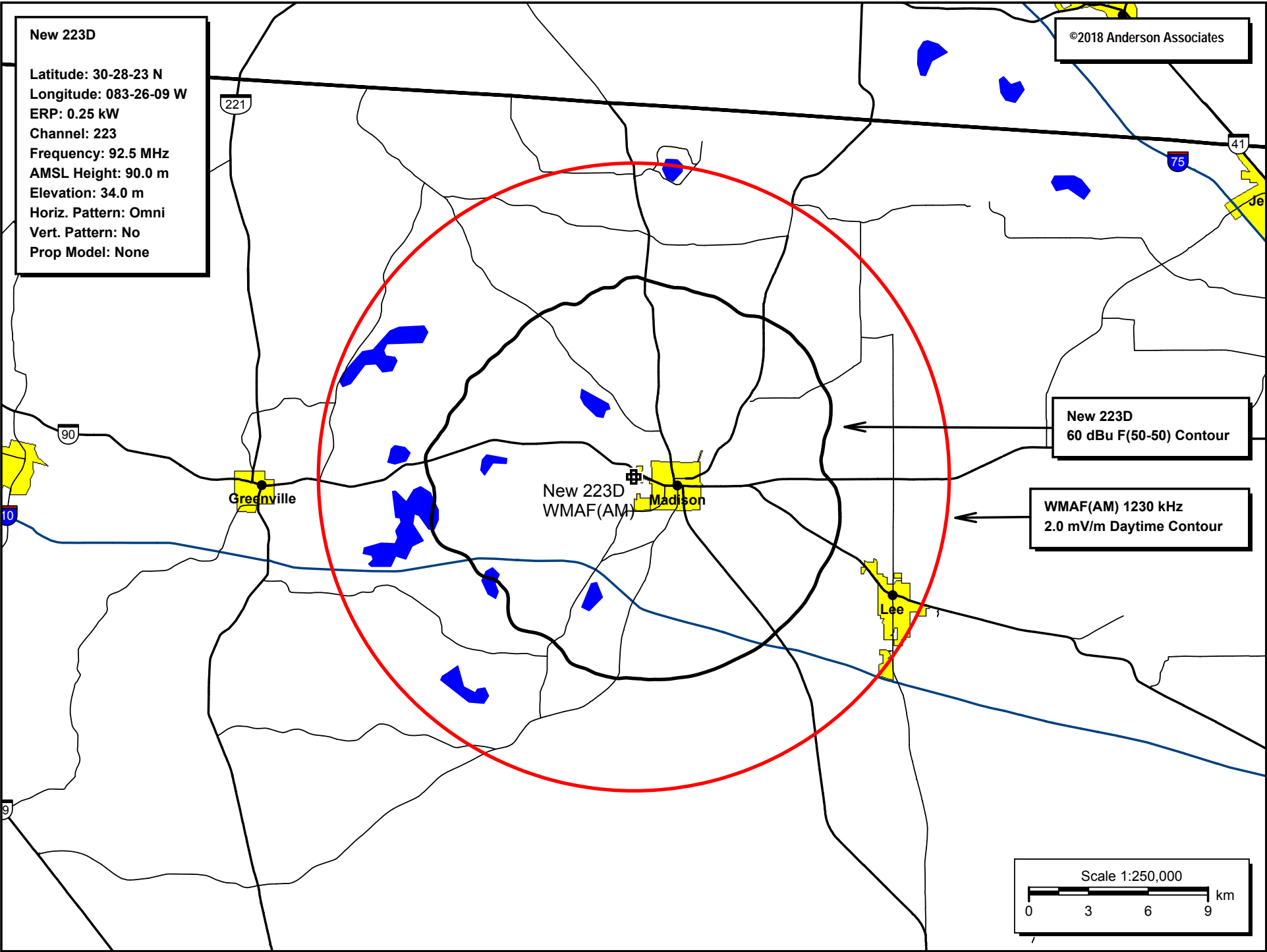


The +40 dBu contour does not encompass population, roads or buildings from a distance of 50 meters from the tower where the interfering contour does reach the ground.

E-4 111 dBu (50:10) Contour



E-5 New 223D 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