

## **Technical Report W285ER Minor Modification**

This technical report is submitted for a minor modification to W285ER, FCC file no. BLFT-20140221ABF. Changes in tower site, COR, antenna and ERP are submitted for the translator to serve as a fill-in facility to rebroadcast WAKY(AM) 620 kHz at Louisville, KY, FCC facility I.D. 30798.

### **W285ER Modification Analysis:**

An overlap study (exhibit E-1) shows the W285ER modification is within the WAYI(FM) 282A third-adjacent protected contour. Using the elevation pattern of the PSI FML-2-0.75 wavelength spaced antenna (exhibit E-2), the +40 115.07 F(50-10) dBu contour within WQSR(FM) (exhibit E-3) lowest point = 14.49 meters above the site elevation, and does not reach any buildings, roads or population, as shown in the aerial photo and street view in exhibits E-4 and E-5.

A waiver of section 74.1233(a)(1) (*Mattoon Waiver*) is also requested for the W285ER modification. The co-channel 40 dBu F(50-10) contour modification overlaps the current 60 dBu F(50-50) contour (exhibit E-6), and is contained within the 25 mile/40 kilometer radius from the WAKY(AM) daytime tower site (exhibit E-7). The modified 60 dBu contour has less than 50% overlap to W261CO and W292FS, which also serve as fill-in facilities for WAKY(AM) (exhibit E-7).

### **Antenna System:**

W285ER is to be relocated to the existing tower, ASR 1264505, at coordinates:

**38 23 47.0N 085 35 17.3W NAD 83.**

A PSI FML, two bay, 0.75 wavelength-spaced, directional antenna (exhibit E-8) will be

mounted at a COR AGL of 58 meters, 269.2 meters AMSL, 84 meter HAAT (exhibit E-9) and operate at 250 watts ERP.

**RF Exposure Calculation:**

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

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

Using a worst case vertical (F) factor of 1.0, the RF is calculated to be 5.33  $\mu\text{W}/\text{cm}^2$  to the ground, which is less than 5% of the 200  $\mu\text{W}/\text{cm}^2$  maximum permissible for general public exposure allowing exclusion from consideration.

**Conclusion:**

It is concluded the W285ER modification complies with all Commission rules and policies.



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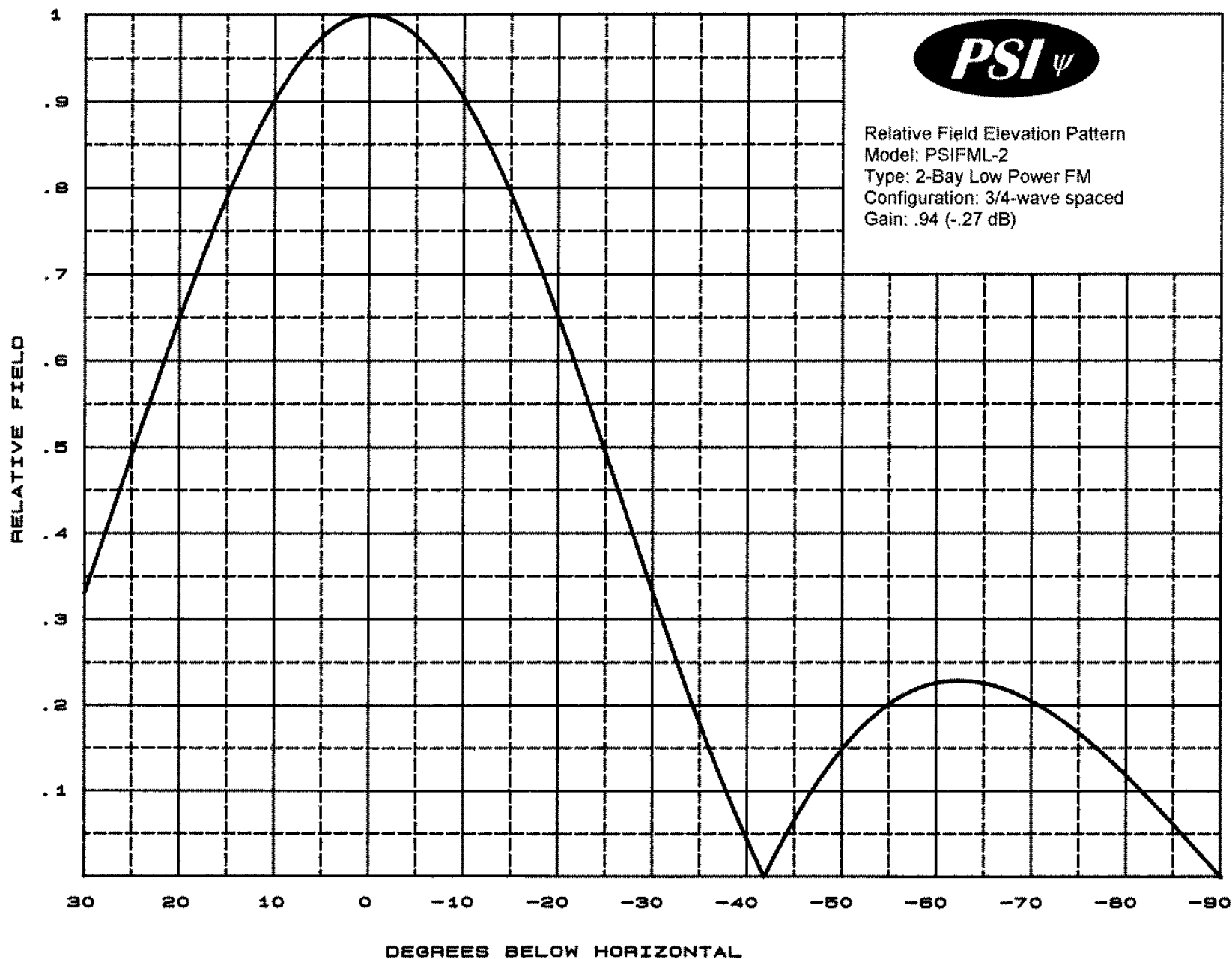
# E-1 W285ER Mod. Overlap Study

REFERENCE 38 23 47.00 N. 85 35 17.30 W.		CH# 285D - 104.9 MHz, Pwr= 0.25 kW DA, HAAT= 84.0 M, COR= 269.2 M Average Protected F(50-50)= 11.84 km Standard Directional								DISPLAY DATES DATA 06-25-21 SEARCH 06-25-21	
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*
285D Middletown	W285ER	LIC DCN KY		166.7 346.8	17.60 BLFT20140221ABF	38 14 32.20 85 32 30.80	0.150 56	246	---Reference---		
285A Frankfort	WFKY	LIC _CN KY		108.1 288.5	61.85 BLH20100122AAB	38 13 18.30 84 54 53.80	3.400 86	69.0 312	19.4 -16.6*		10.8
282A Charlestown	WAYI	LIC _CN IN		341.0 161.0	10.06 BLH19980217KF	38 28 55.20 85 37 32.90	3.000 100	2.3 277	24.0 -4.7*		-15.1*(1)
286A Shepherdsville	WGHL	LIC ZCN KY		206.2 26.1	38.95 BLH20080326AEW	38 04 55.20 85 47 05.90	1.900 180	40.0 342	24.2 -8.6*		0.5
285A Columbus	WINN	LIC _CN IN		339.9 159.7	93.50 BLH19910501KA	39 11 09.10 85 57 36.90	6.000 91	87.6 297	29.0 -6.7		21.3
284D New Albany	W284AD	LIC _CN IN		228.0 47.9	27.50 BLFT20140221ABH	38 13 50.30 85 49 19.90	0.099 115	17.8 276	11.9 -1.0		0.5
284D New Albany	W284AD	CP _CN IN		228.0 47.9	27.50 0000147166	38 13 50.30 85 49 19.90	0.099 115	17.8 276	11.9 -1.0		0.5
287A Scottsburg	WMPI	LIC _CN IN		346.3 166.3	36.14 BLH19940411KE	38 42 44.20 85 41 11.80	2.200 156	2.3 346	26.6 21.2		8.5
284B Jasper	WITZ-FM	LIC _CN IN		267.9 87.1	117.98 BLH6255	38 21 02.20 86 56 26.00	50.000 119	72.8 273	60.1 31.3		28.3
285A Leitchfield	WKHG	LIC _CN KY		212.1 31.7	115.95 BMLH19921214KC	37 30 40.10 86 17 14.90	3.500 83	76.7 279	23.1 29.8		58.9
286B Cincinnati	WUBE-FM	LIC _CN OH		49.0 229.7	124.42 BLH20170320AAM	39 07 30.20 84 29 55.80	14.500 280	77.2 491	65.7 34.3		31.2
288A Fort Knox	WLVK	LIC _CN KY		202.6 22.4	73.84 BLH20010620AAA	37 46 57.20 85 54 37.90	3.200 139	2.7 357	29.7 60.0		42.4

Terrain database is GLOBE 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.

- (1) The +40 115.07 F(50-10) dBu contour within the WAYI(FM) 282A third-adjacent protected contour (exhibit E-3) does not reach any population, roads or buildings (exhibits E-4 and E-5).

# E-2 W285ER Mod. Antenna Vertical Elevation Pattern and Tabulation



**Propagation Systems Inc.**

Elevation Pattern Tabulation

Antenna: PSIFML-2 Special

Bay spacing: 3/4 wave

Angle	Field	dB	Angle	Field	dB	Angle	Field	dB
-90.00	0.001	-60.000	-50.00	0.149	-16.513	-10.00	0.903	-0.883
-89.00	0.012	-38.221	-49.00	0.135	-17.364	-9.00	0.921	-0.713
-88.00	0.025	-32.201	-48.00	0.120	-18.405	-8.00	0.937	-0.561
-87.00	0.037	-28.679	-47.00	0.104	-19.677	-7.00	0.952	-0.429
-86.00	0.049	-26.207	-46.00	0.086	-21.289	-6.00	0.964	-0.315
-85.00	0.061	-24.285	-45.00	0.068	-23.404	-5.00	0.975	-0.219
-84.00	0.073	-22.748	-44.00	0.048	-26.425	-4.00	0.984	-0.139
-83.00	0.085	-21.443	-43.00	0.027	-31.481	-3.00	0.991	-0.079
-82.00	0.096	-20.349	-42.00	0.005	-46.848	-2.00	0.996	-0.036
-81.00	0.107	-19.378	-41.00	0.018	-34.664	-1.00	0.999	-0.009
-80.00	0.118	-18.538	-40.00	0.043	-27.417	0.00	1.000	0.000
-79.00	0.129	-17.792	-39.00	0.068	-23.365	1.00	0.999	-0.009
-78.00	0.139	-17.125	-38.00	0.094	-20.529	2.00	0.996	-0.036
-77.00	0.149	-16.522	-37.00	0.121	-18.329	3.00	0.991	-0.079
-76.00	0.159	-15.984	-36.00	0.149	-16.531	4.00	0.984	-0.139
-75.00	0.168	-15.508	-35.00	0.178	-14.998	5.00	0.975	-0.219
-74.00	0.176	-15.072	-34.00	0.207	-13.669	6.00	0.964	-0.315
-73.00	0.184	-14.685	-33.00	0.237	-12.489	7.00	0.952	-0.429
-72.00	0.192	-14.335	-32.00	0.268	-11.431	8.00	0.937	-0.561
-71.00	0.199	-14.026	-31.00	0.299	-10.475	9.00	0.921	-0.713
-70.00	0.205	-13.752	-30.00	0.331	-9.602	10.00	0.903	-0.882
-69.00	0.211	-13.518	-29.00	0.363	-8.801	11.00	0.884	-1.072
-68.00	0.216	-13.315	-28.00	0.395	-8.061	12.00	0.863	-1.279
-67.00	0.220	-13.146	-27.00	0.428	-7.377	13.00	0.841	-1.508
-66.00	0.224	-13.009	-26.00	0.460	-6.742	14.00	0.817	-1.757
-65.00	0.226	-12.904	-25.00	0.493	-6.151	15.00	0.792	-2.029
-64.00	0.228	-12.834	-24.00	0.525	-5.599	16.00	0.765	-2.322
-63.00	0.229	-12.800	-23.00	0.557	-5.083	17.00	0.738	-2.639
-62.00	0.229	-12.794	-22.00	0.589	-4.603	18.00	0.710	-2.979
-61.00	0.228	-12.829	-21.00	0.620	-4.154	19.00	0.680	-3.344
-60.00	0.227	-12.898	-20.00	0.650	-3.736	20.00	0.650	-3.736
-59.00	0.224	-13.009	-19.00	0.680	-3.344	21.00	0.620	-4.154
-58.00	0.220	-13.158	-18.00	0.710	-2.979	22.00	0.589	-4.603
-57.00	0.215	-13.351	-17.00	0.738	-2.639	23.00	0.557	-5.083
-56.00	0.209	-13.600	-16.00	0.765	-2.323	24.00	0.525	-5.599
-55.00	0.202	-13.894	-15.00	0.792	-2.029	25.00	0.493	-6.151
-54.00	0.194	-14.260	-14.00	0.817	-1.759	26.00	0.460	-6.742
-53.00	0.184	-14.685	-13.00	0.840	-1.510	27.00	0.428	-7.377
-52.00	0.174	-15.192	-12.00	0.863	-1.281	28.00	0.395	-8.061
-51.00	0.162	-15.795	-11.00	0.884	-1.072	29.00	0.363	-8.801
						30.00	0.331	-9.602

E-3 W285ER Mod. +40 115.07 F(50-10) dBu Contour Tabulation Within WAYI(FM) 282A

W285ER Middletown, KY, Showing Protection to WAYI(FM), Channel: 282  
Geographic Coordinates: N. 38 23 47.00 W. 85 35 17.30  
74.1204(d) Study - Using GLOBE 30 SEC Terrain Database  
Translator or LPFM Maximum Licensed ERP = 0.25 kW, Channel: 285  
Translator or LPFM Antenna Height AG = 58 meters  
W285ER Antenna Model = PSI FML-2-075

Protected Station's Contour = 75.06631 dBu  
Translator's or LPFM's full Interference contour 115.06631

Review Azimuth = 0 Degrees True  
Horizontal Relative Field at Review Azimuth = 1.000  
Translator/LPFM ERP on the horizontal at Review Azimuth = 0.25 kW  
Distance between stations = 10.1 km  
Protected Station= WAYI, 3 kW, 277 M meters COR AMSL

Depression Angle From Degree(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	195.7287	195.7287	058.000
01.00	0.998	1.0	0.2490	195.3372	195.3075	054.591
02.00	0.996	1.0	0.2480	194.9458	194.8270	051.196
03.00	0.991	1.0	0.2455	193.9671	193.7013	047.849
04.00	0.984	1.0	0.2421	192.5970	192.1279	044.565
05.00	0.975	1.0	0.2377	190.8355	190.1093	041.368
06.00	0.964	1.0	0.2323	188.6825	187.6488	038.277
07.00	0.952	1.0	0.2266	186.3337	184.9448	035.292
08.00	0.937	1.0	0.2195	183.3978	181.6130	032.476
09.00	0.921	1.0	0.2121	180.2661	178.0468	029.800
10.00	0.903	1.0	0.2039	176.7430	174.0579	027.309
11.00	0.884	1.0	0.1954	173.0242	169.8452	024.985
12.00	0.863	1.0	0.1862	168.9139	165.2227	022.881
13.00	0.84	1.0	0.1764	164.4121	160.1982	021.015
14.00	0.817	1.0	0.1669	159.9103	155.1603	019.314
15.00	0.792	1.0	0.1568	155.0171	149.7350	017.879
16.00	0.765	1.0	0.1463	149.7325	143.9321	016.728
17.00	0.738	1.0	0.1362	144.4478	138.1361	015.768
18.00	0.71	1.0	0.1260	138.9674	132.1658	015.057
19.00	0.68	1.0	0.1156	133.0955	125.8443	014.668
20.00	0.65	1.0	0.1056	127.2236	119.5511	014.487(1)
21.00	0.62	1.0	0.0961	121.3518	113.2917	014.511
22.00	0.589	1.0	0.0867	115.2842	106.8896	014.814
23.00	0.557	1.0	0.0776	109.0209	100.3542	015.402
24.00	0.525	1.0	0.0689	102.7576	093.8737	016.205
25.00	0.493	1.0	0.0608	096.4942	087.4535	017.220
26.00	0.46	1.0	0.0529	090.0352	080.9231	018.531
27.00	0.428	1.0	0.0458	083.7719	074.6413	019.968
28.00	0.395	1.0	0.0390	077.3128	068.2632	021.704
29.00	0.363	1.0	0.0329	071.0495	062.1413	023.555
30.00	0.331	1.0	0.0274	064.7862	056.1065	025.607
31.00	0.299	1.0	0.0224	058.5229	050.1639	027.858
32.00	0.268	1.0	0.0180	052.4553	044.4846	030.203
33.00	0.237	1.0	0.0140	046.3877	038.9040	032.735
34.00	0.207	1.0	0.0107	040.5158	033.5892	035.344
35.00	0.178	1.0	0.0079	034.8397	028.5390	038.017
36.00	0.149	1.0	0.0056	029.1636	023.5938	040.858
37.00	0.121	1.0	0.0037	023.6832	018.9142	043.747
38.00	0.094	1.0	0.0022	018.3985	014.4982	046.673
39.00	0.068	1.0	0.0012	013.3096	010.3435	049.624
40.00	0.043	1.0	0.0005	008.4163	006.4473	052.590
41.00	0.018	1.0	0.0001	003.5231	002.6589	055.689
42.00	0.005	1.0	0.0000	000.9786	000.7273	057.345
43.00	0.027	1.0	0.0002	005.2847	003.8650	054.396
44.00	0.048	1.0	0.0006	009.3950	006.7582	051.474
45.00	0.068	1.0	0.0012	013.3096	009.4113	048.589
46.00	0.086	1.0	0.0018	016.8327	011.6930	045.892
47.00	0.104	1.0	0.0027	020.3558	013.8826	043.113
48.00	0.12	1.0	0.0036	023.4874	015.7162	040.545
49.00	0.135	1.0	0.0046	026.4234	017.3353	038.058
50.00	0.149	1.0	0.0056	029.1636	018.7460	035.659
51.00	0.162	1.0	0.0066	031.7080	019.9545	033.358
52.00	0.174	1.0	0.0076	034.0568	020.9675	031.163
53.00	0.184	1.0	0.0085	036.0141	021.6738	029.238
54.00	0.194	1.0	0.0094	037.9714	022.3190	027.281
55.00	0.202	1.0	0.0102	039.5372	022.6776	025.613
56.00	0.209	1.0	0.0109	040.9073	022.8751	024.086
57.00	0.215	1.0	0.0116	042.0817	022.9193	022.707
58.00	0.22	1.0	0.0121	043.0603	022.8185	021.483
59.00	0.224	1.0	0.0125	043.8432	022.5809	020.419
60.00	0.227	1.0	0.0129	044.4304	022.2152	019.522
61.00	0.228	1.0	0.0130	044.6261	021.6352	018.969
62.00	0.229	1.0	0.0131	044.8219	021.0426	018.425
63.00	0.229	1.0	0.0131	044.8219	020.3487	018.063
64.00	0.228	1.0	0.0130	044.6261	019.5628	017.890
65.00	0.226	1.0	0.0128	044.2347	018.6944	017.910

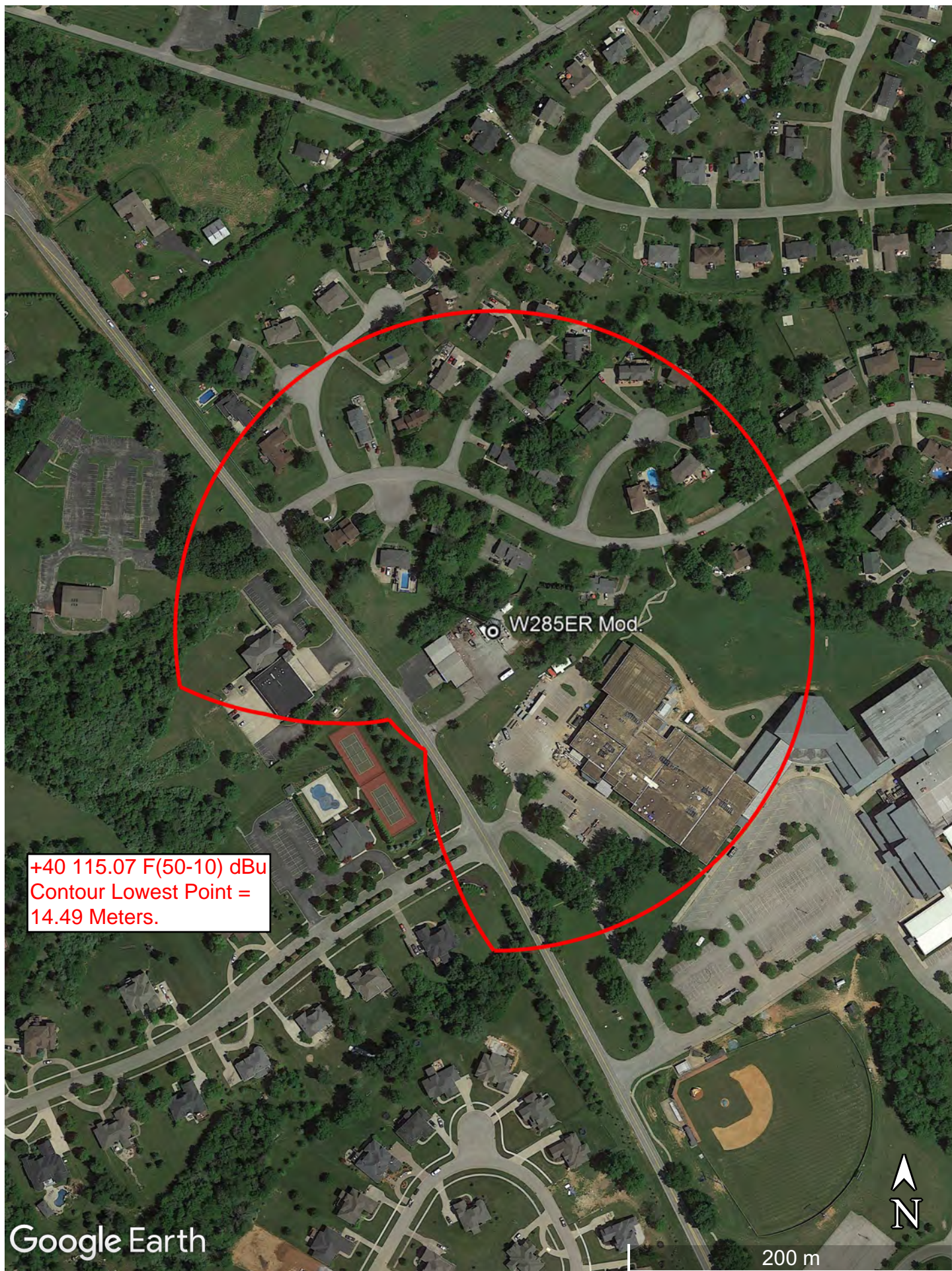
E-3 W285ER Mod. +40 115.07 F(50-10) dBu Contour Tabulation Within WAYI(FM) 282A, cont.

Depression Angle From Degree (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)
66.00	0.224	1.0	0.0125	043.8432	017.8326	017.947
67.00	0.22	1.0	0.0121	043.0603	016.8250	018.363
68.00	0.216	1.0	0.0117	042.2774	015.8374	018.801
69.00	0.211	1.0	0.0111	041.2988	014.8001	019.444
70.00	0.205	1.0	0.0105	040.1244	013.7233	020.295
71.00	0.199	1.0	0.0099	038.9500	012.6809	021.172
72.00	0.192	1.0	0.0092	037.5799	011.6128	022.259
73.00	0.184	1.0	0.0085	036.0141	010.5295	023.560
74.00	0.176	1.0	0.0077	034.4483	009.4952	024.886
75.00	0.168	1.0	0.0071	032.8824	008.5106	026.238
76.00	0.159	1.0	0.0063	031.1209	007.5288	027.804
77.00	0.149	1.0	0.0056	029.1636	006.5604	029.584
78.00	0.139	1.0	0.0048	027.2063	005.6565	031.388
79.00	0.129	1.0	0.0042	025.2490	004.8177	033.215
80.00	0.118	1.0	0.0035	023.0960	004.0106	035.255
81.00	0.107	1.0	0.0029	020.9430	003.2762	037.315
82.00	0.096	1.0	0.0023	018.7900	002.6151	039.393
83.00	0.085	1.0	0.0018	016.6369	002.0275	041.487
84.00	0.073	1.0	0.0013	014.2882	001.4935	043.790
85.00	0.061	1.0	0.0009	011.9395	001.0406	046.106
86.00	0.049	1.0	0.0006	009.5907	000.6690	048.433
87.00	0.037	1.0	0.0003	007.2420	000.3790	050.768
88.00	0.025	1.0	0.0002	004.8932	000.1708	053.110
89.00	0.012	1.0	0.0000	002.3487	000.0410	055.652
90.00	0.001	1.0	0.0000	000.1957	000.0000	057.804

(1) The +40 115.07 F(50-10) dBu contour lowest point = 14.49 meters above the site elevation, which does not reach any population, buildings or roads, as shown in the aerial photo and street view (exhibits E-4 and E-5).



E-4 W285ER Mod. +40 115.07 F(50-10) dBu Contour Aerial Photo

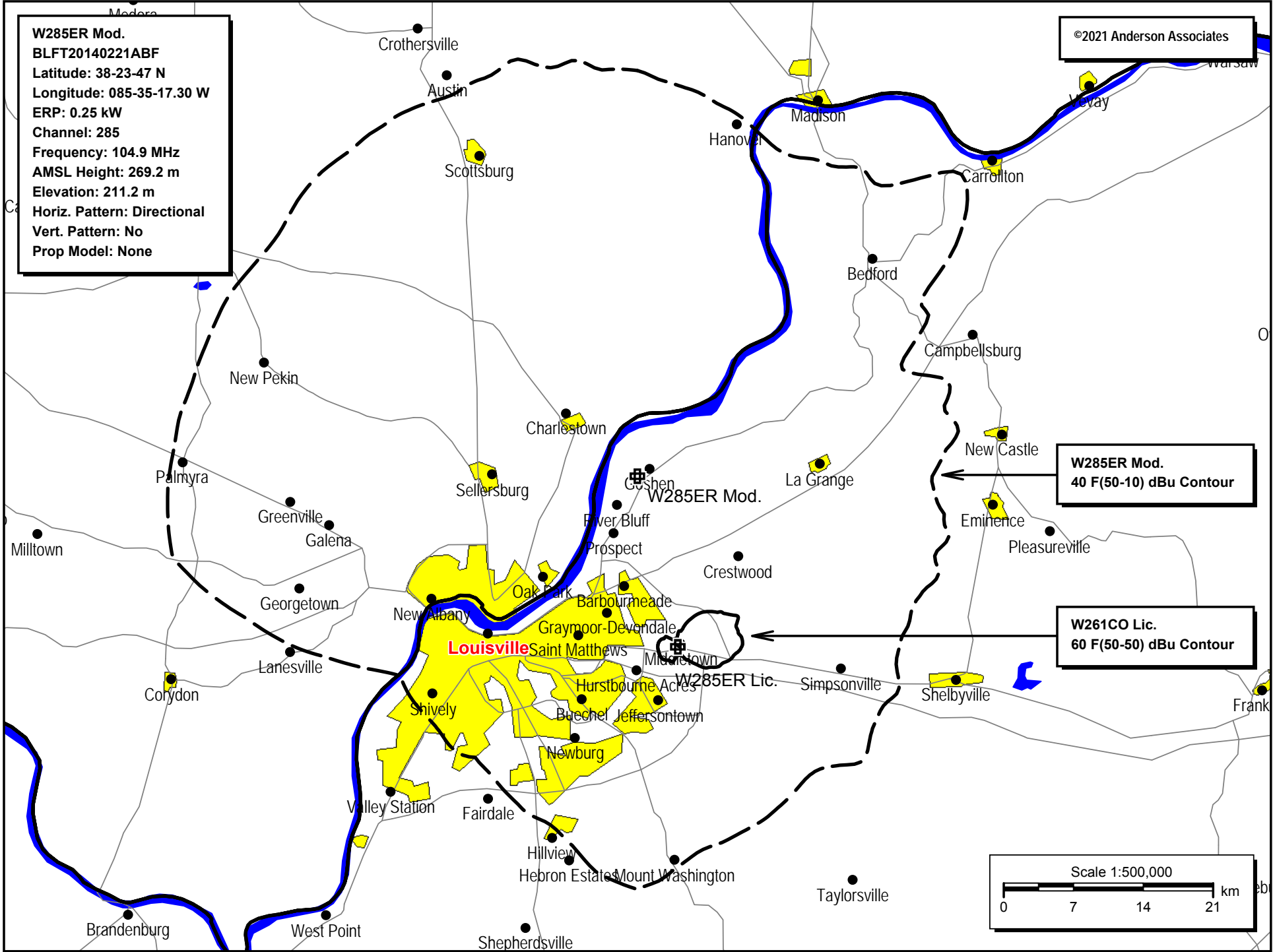




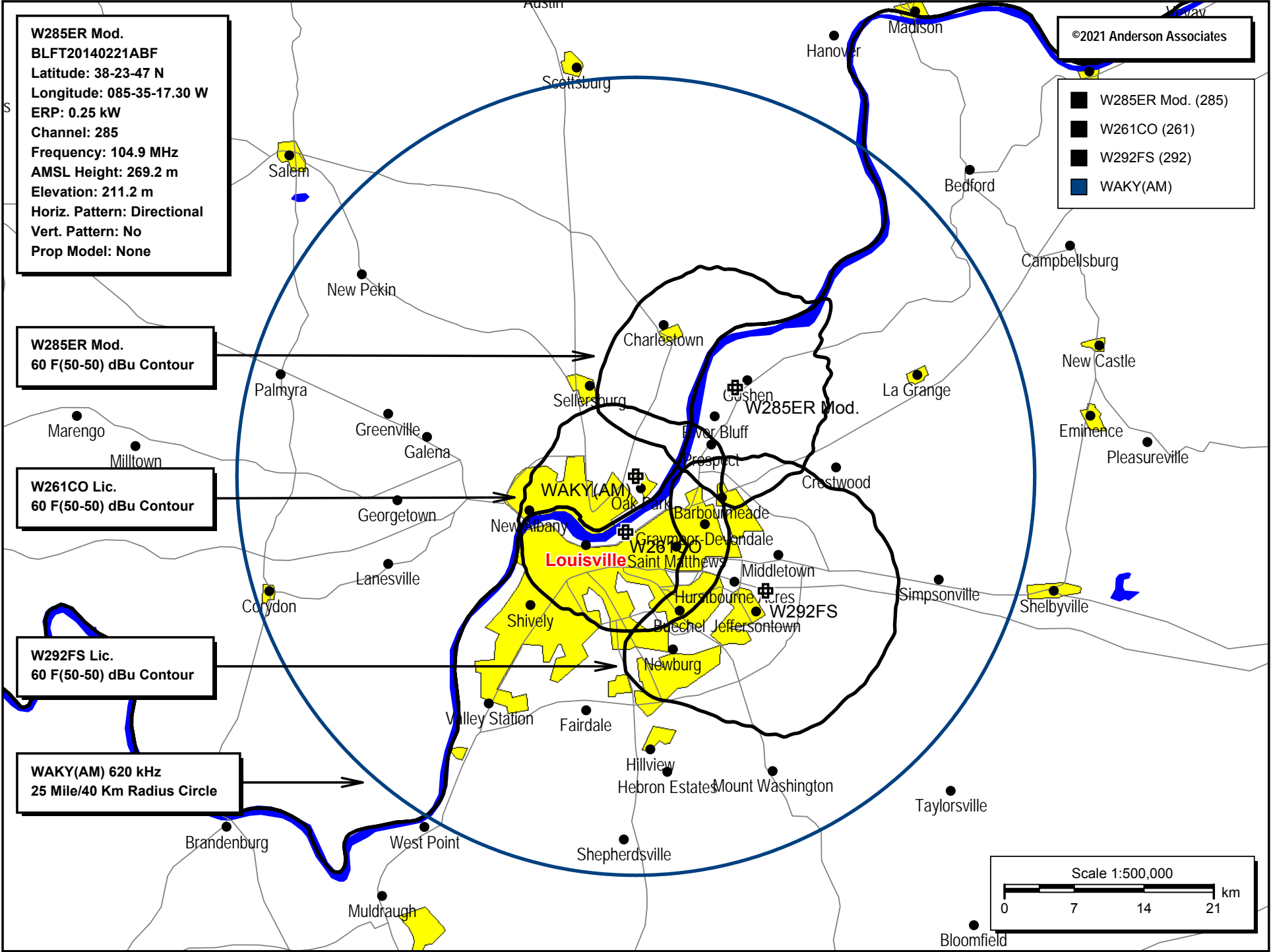




E-6 W285ER Mod. Contour Overlap Plot

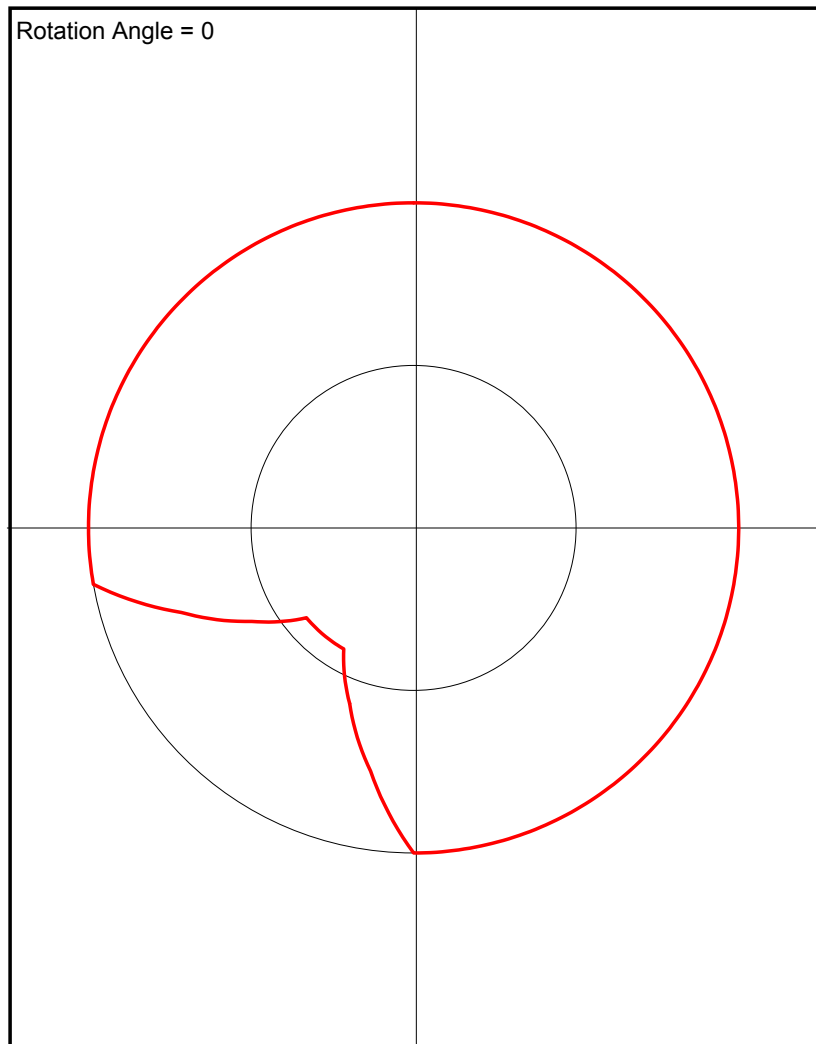


E-7 W285ER Mod. W261CO W292FS 60 dBu Contour Plot



# E-8 W285ER Mod. Antenna Pattern

Azimuth (deg)	Relative Field
0.0	1.0
10.0	1.0
20.0	1.0
30.0	1.0
40.0	1.0
50.0	1.0
60.0	1.0
70.0	1.0
80.0	1.0
90.0	1.0
100.0	1.0
110.0	1.0
120.0	1.0
130.0	1.0
140.0	1.0
150.0	1.0
160.0	1.0
170.0	1.0
180.0	1.0
190.0	0.76
200.0	0.575
210.0	0.43
220.0	0.43
230.0	0.43
240.0	0.575
250.0	0.76
260.0	1.0
270.0	1.0
280.0	1.0
290.0	1.0
300.0	1.0
310.0	1.0
320.0	1.0
330.0	1.0
340.0	1.0
350.0	1.0



## E-9 W285ER Mod. HAAT Calculation

### Antenna Height Above Average Terrain Calculations -- Results

#### Input Data

Latitude **38° 23' 47"** North  
Longitude **85° 35' 17.3"** West (NAD 83)

Height of antenna radiation center above mean sea level: **269.2** meters AMSL

Number of Evenly Spaced Radials = **12**      0° is referenced to True North

#### Results

Calculated HAAT = **84 meters**

Antenna Height Above Average Terrain calculated  
using 1 km [GLOBE terrain data](#)

#### Individual "Radial HAAT" Values, in meters

0°	84.4 m
30°	68.4 m
60°	57.4 m
90°	46.9 m
120°	51.3 m
150°	61.7 m
180°	87.0 m
210°	129.9 m
240°	118.2 m
270°	115.5 m
300°	97.8 m
330°	95.2 m



## ASR Registration 1264505

### Registration Detail

Reg Number	1264505	Status	Constructed
File Number	A1162525	Constructed	08/12/2008
EMI	No	Dismantled	
NEPA	No		

### Antenna Structure

Structure Type TOWER - Free standing or Guyed Structure used for Commu

#### Location (in NAD83 Coordinates)

Lat/Long	38-23-47.0 N 085-35-17.3 W	Address	1721 South Highway 1793 (9LV1087)
City, State	Goshen , KY		
Zip	40026	County	OLDHAM
Center of AM Array		Position of Tower in Array	

#### Heights (meters)

Elevation of Site Above Mean Sea Level	Overall Height Above Ground (AGL)
211.2	83.8
Overall Height Above Mean Sea Level	Overall Height Above Ground w/o Appurtenances
295.0	83.8

#### Painting and Lighting Specifications

FAA Chapters 4, 8, 12

Paint and Light in Accordance with FAA Circular Number 70/7460-1K

#### FAA Notification

FAA Study	2007-ASO-3178-OE	FAA Issue Date	11/15/2007
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#### Owner & Contact Information

FRN	0014510861	Owner Entity Type	Limited Liability Company
Assignor FRN	0004336277	Assignor ID	L00135925

#### Owner

T-Mobile South LLC  
Attention To: FCC Regulatory Compliance  
12920 SE 38th Street  
Bellevue , WA 98006

P: (425)383-8401  
F:  
E: FCCRegulatoryComplianceContact@T-Mobile.com

#### Contact

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#### Last Action Status

Status	Constructed	Received	04/06/2020
Purpose	Change Owner	Entered	04/06/2020
Mode	Interactive		