

ENGINEERING STATEMENT

The engineering data contained herein have been prepared on behalf of TRI-STATE CHRISTIAN TV, INC., licensee of full-power digital television station WTCT-DT, Channel 17 in Marion, Illinois, in support of its request for Special Temporary Authority to specify operation on its post-repack channel, Channel 30, with an interim facility. This engineering STA is required due to the fact that the helicopter crew that was hired to install the post-repack antenna cancelled the job and needs to be rescheduled. No change in site location is proposed herein.

It is proposed to mount an ERI directional horizontally-polarized slotted cylinder emergency antenna at the 121.9-meter level of the existing 152-meter tower on which the present WTCT-DT pre-repack antenna was mounted. The proposed effective radiated power for the instant facility is 82.1 kW. Exhibit B is a map upon which the predicted service contours are plotted. As shown, the community of Marion is completely encompassed by the proposed STA 48 dBu city-grade service contour. In Exhibit C, we provide a map comparing the noise-limited service contours of the WTCT-DT post-repack facility, as authorized in LMS-0000034912, and that for the proposed STA facility. It is important to note that the STA contour is completely contained within that authorized to WTCT-DT, post-repack. For this reason, no interference study is presented herein.

Elevation and azimuth pattern information for the proposed antenna are provided in Exhibit D. A power density calculation appears as Exhibit E.

Since no change in the overall height or location of the existing WTCT-DT tower is proposed herein, the Federal Aviation Administration has not been notified of this application.

EXHIBIT A

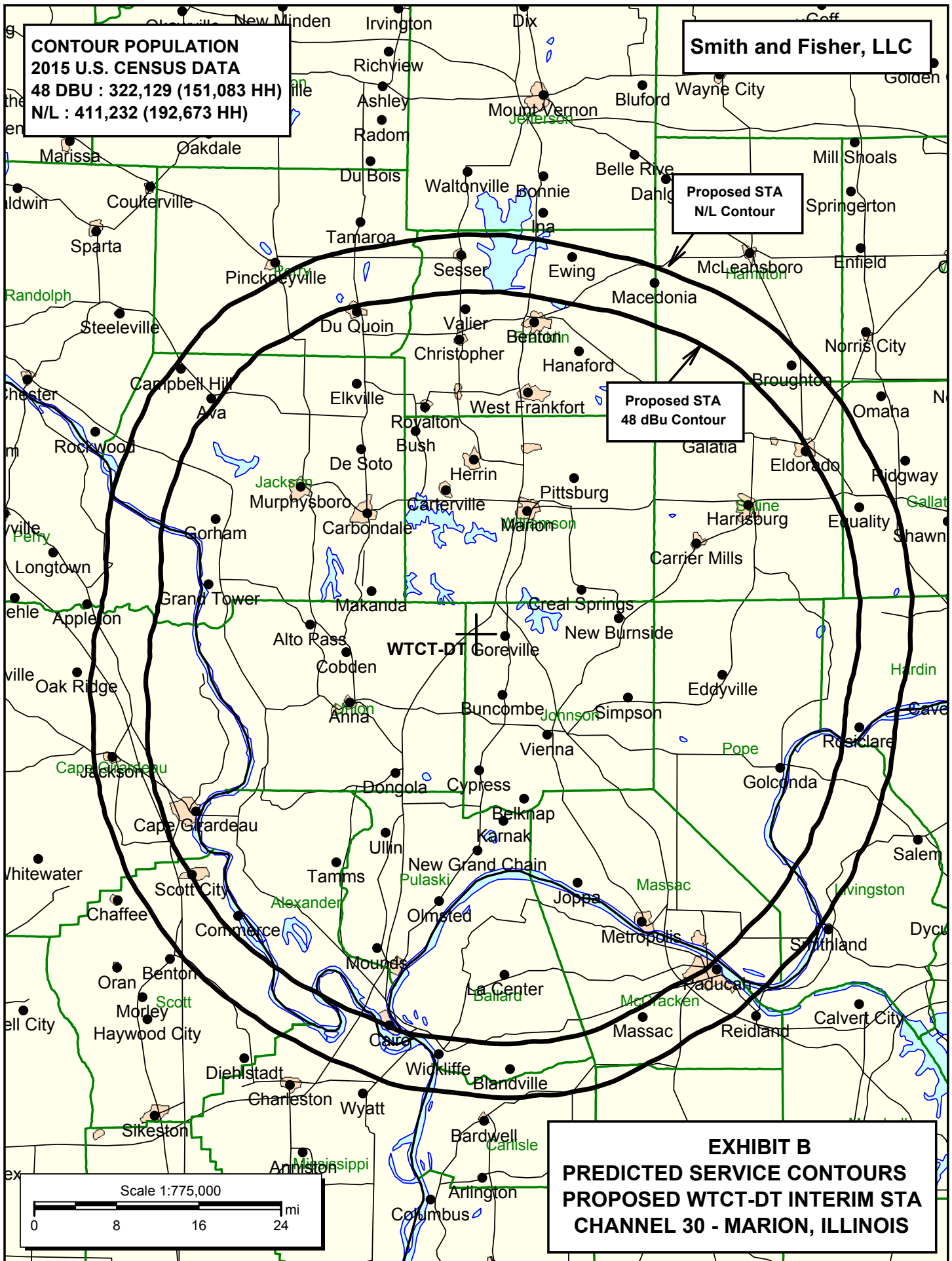
In addition, the Federal Communications Commission issued Antenna Structure Registration Number 1040116 to this tower.

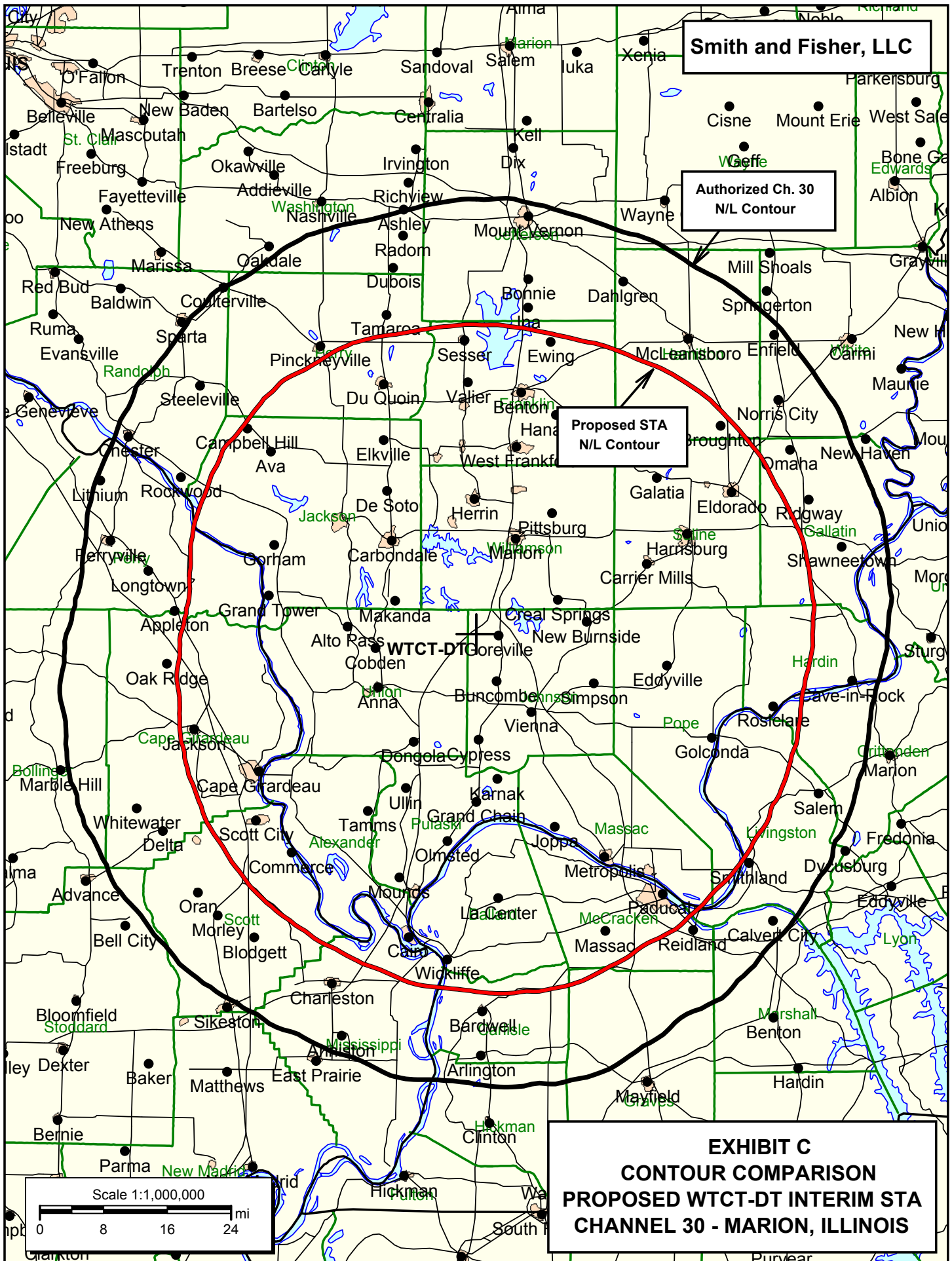
I declare under penalty of perjury that the foregoing statements and the attached exhibits, which were prepared by me or under my immediate supervision, are true and correct to the best of my knowledge and belief.

A handwritten signature in blue ink, appearing to read "K. T. Fisher", with a stylized, elongated final letter.

KEVIN T. FISHER

October 14, 2019

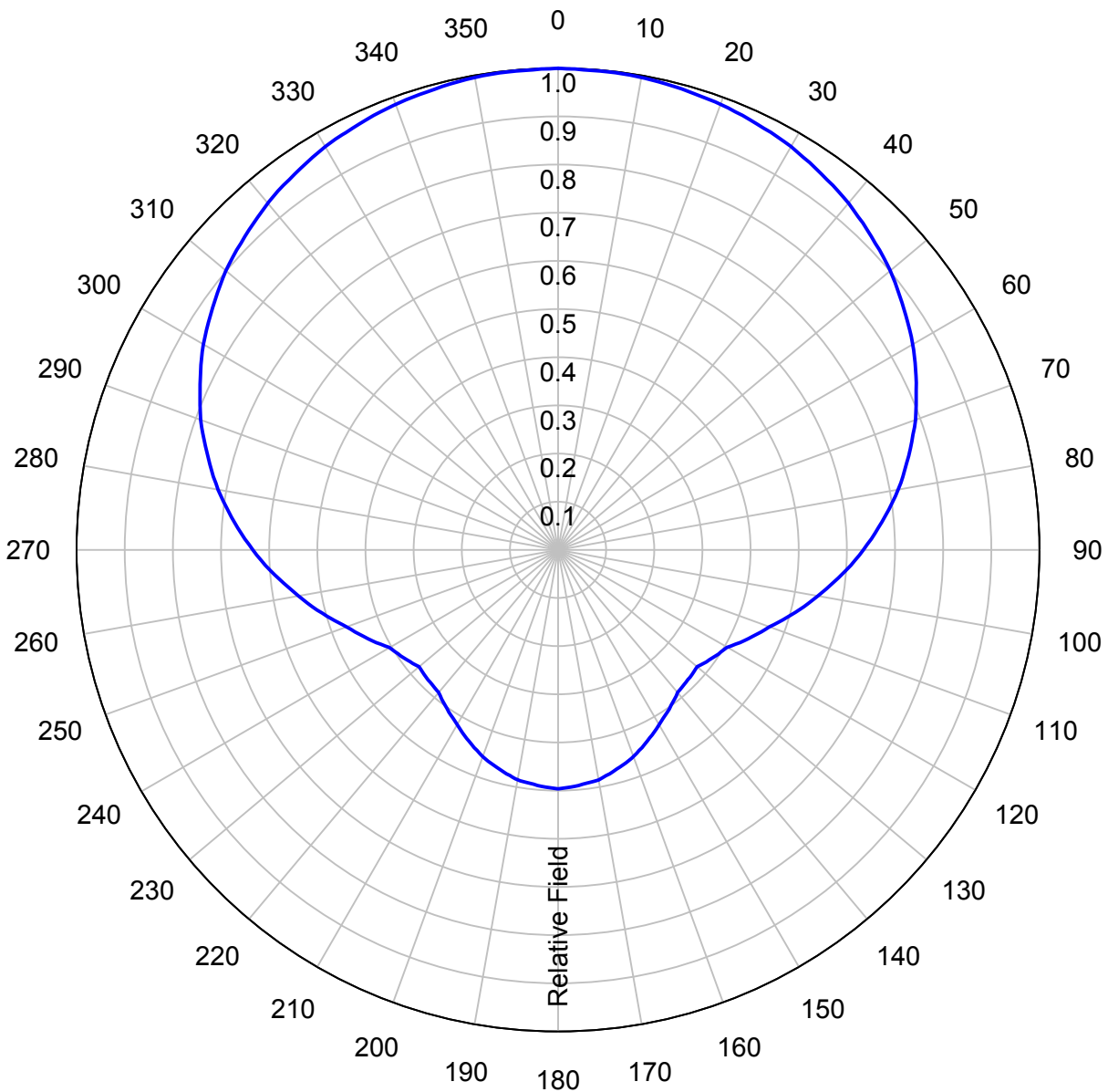




**AZIMUTH PATTERN**

**Type:** ATW-GS  
**Directivity:** Numeric dBd  
2.00 3.01  
**Peak(s) at:** \_\_\_\_\_

**Channel:** 30  
**Location:** \_\_\_\_\_  
**Polarization:** Horizontal  
Note: Pattern shape and directivity may vary with  
channel and mouting configuration.



*Preliminary, subject to final design and review.*

## **TABULATED DATA FOR AZIMUTH PATTERN FCC FILING FORMAT**

Type: ATW-GS

Polarization Horizontal

<b>ANGLE</b>	<b>FIELD</b>	<b>ERP (kW)</b>	<b>ERP (dBk)</b>
0	1.000	76.018	18.809
10	0.996	75.411	18.774
20	0.985	73.755	18.678
30	0.967	71.084	18.518
40	0.939	67.027	18.262
50	0.901	61.711	17.904
60	0.851	55.052	17.408
70	0.790	47.443	16.762
80	0.717	39.080	15.920
90	0.634	30.556	14.851
100	0.548	22.829	13.585
110	0.467	16.579	12.196
120	0.405	12.469	10.958
130	0.377	10.804	10.336
140	0.386	11.326	10.541
150	0.419	13.346	11.253
160	0.457	15.876	12.007
170	0.485	17.881	12.524
180	0.496	18.702	12.719
190	0.485	17.881	12.524
200	0.457	15.876	12.007
210	0.419	13.346	11.253
220	0.386	11.326	10.541
230	0.377	10.804	10.336
240	0.405	12.469	10.958
250	0.467	16.579	12.196
260	0.548	22.829	13.585
270	0.634	30.556	14.851
280	0.717	39.080	15.920
290	0.790	47.443	16.762
300	0.851	55.052	17.408
310	0.901	61.711	17.904
320	0.939	67.027	18.262
330	0.967	71.084	18.518
340	0.985	73.755	18.678
350	0.996	75.411	18.774

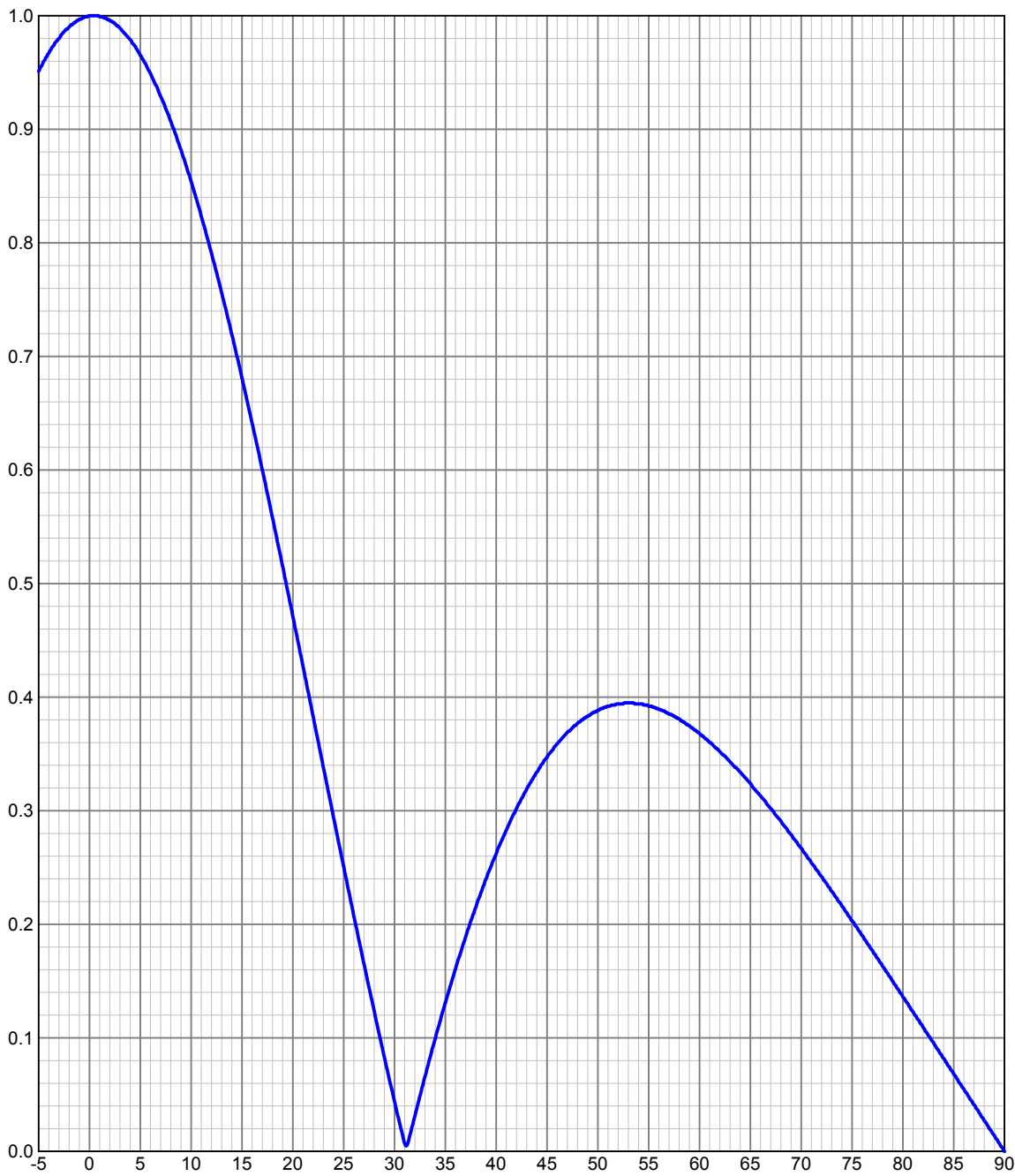
*Preliminary, subject to final design and review.*



ELEVATION PATTERN

Type:	ATW2G1H2H		Channel:	30
Directivity:	Numeric	dBd	Location:	
Main Lobe:	2.00	3.01	Beam Tilt:	0.40
Horizontal:	2.00	3.01	Polarization:	Horizontal

Relative Field



Preliminary, subject to final design and review.

**TABULATED DATA FOR ELEVATION PATTERN****Type:** ATW2G1H2H**Polarization**Horizontal

ANGLEFIELD		dB	ANGLEFIELD		dB	ANGLEFIELD		dB	ANGLEFIELD		dB	ANGLEFIELD		dB
-5.00	0.951	-0.44	6.75	0.935	-0.59	27.00	0.165	-15.65	50.50	0.390	-8.18	74.00	0.216	-13.31
-4.75	0.956	-0.40	7.00	0.929	-0.64	27.50	0.144	-16.83	51.00	0.392	-8.13	74.50	0.210	-13.56
-4.50	0.960	-0.35	7.25	0.924	-0.69	28.00	0.124	-18.13	51.50	0.393	-8.11	75.00	0.203	-13.85
-4.25	0.964	-0.32	7.50	0.918	-0.74	28.50	0.103	-19.74	52.00	0.394	-8.09	75.50	0.197	-14.11
-4.00	0.967	-0.29	7.75	0.913	-0.79	29.00	0.083	-21.62	52.50	0.394	-8.09	76.00	0.190	-14.42
-3.75	0.971	-0.26	8.00	0.907	-0.85	29.50	0.063	-24.01	53.00	0.395	-8.07	76.50	0.183	-14.75
-3.50	0.974	-0.23	8.25	0.901	-0.91	30.00	0.044	-27.13	53.50	0.395	-8.07	77.00	0.177	-15.04
-3.25	0.978	-0.20	8.50	0.895	-0.96	30.50	0.025	-32.04	54.00	0.394	-8.09	77.50	0.170	-15.39
-3.00	0.980	-0.18	8.75	0.888	-1.03	31.00	0.007	-43.10	54.50	0.393	-8.11	78.00	0.163	-15.76
-2.75	0.984	-0.14	9.00	0.882	-1.09	31.50	0.014	-37.08	55.00	0.392	-8.13	78.50	0.157	-16.08
-2.50	0.986	-0.12	9.25	0.875	-1.16	32.00	0.031	-30.17	55.50	0.391	-8.16	79.00	0.150	-16.48
-2.25	0.988	-0.10	9.50	0.868	-1.23	32.50	0.049	-26.20	56.00	0.389	-8.20	79.50	0.143	-16.89
-2.00	0.990	-0.09	9.75	0.861	-1.30	33.00	0.066	-23.61	56.50	0.388	-8.22	80.00	0.136	-17.33
-1.75	0.992	-0.07	10.00	0.854	-1.37	33.50	0.083	-21.62	57.00	0.385	-8.29	80.50	0.130	-17.72
-1.50	0.994	-0.05	10.50	0.839	-1.52	34.00	0.099	-20.09	57.50	0.383	-8.34	81.00	0.123	-18.20
-1.25	0.996	-0.04	11.00	0.823	-1.69	34.50	0.115	-18.79	58.00	0.381	-8.38	81.50	0.116	-18.71
-1.00	0.997	-0.03	11.50	0.807	-1.86	35.00	0.131	-17.65	58.50	0.378	-8.45	82.00	0.109	-19.25
-0.75	0.998	-0.02	12.00	0.791	-2.04	35.50	0.146	-16.71	59.00	0.375	-8.52	82.50	0.102	-19.83
-0.50	0.999	-0.01	12.50	0.774	-2.23	36.00	0.161	-15.86	59.50	0.371	-8.61	83.00	0.096	-20.35
-0.25	0.999	-0.01	13.00	0.756	-2.43	36.50	0.175	-15.14	60.00	0.368	-8.68	83.50	0.089	-21.01
0.00	1.000	0.00	13.50	0.738	-2.64	37.00	0.189	-14.47	60.50	0.364	-8.78	84.00	0.082	-21.72
0.25	1.000	0.00	14.00	0.719	-2.87	37.50	0.203	-13.85	61.00	0.360	-8.87	84.50	0.075	-22.50
0.50	1.000	0.00	14.50	0.700	-3.10	38.00	0.215	-13.35	61.50	0.356	-8.97	85.00	0.068	-23.35
0.75	1.000	0.00	15.00	0.681	-3.34	38.50	0.228	-12.84	62.00	0.352	-9.07	85.50	0.061	-24.29
1.00	0.999	-0.01	15.50	0.661	-3.60	39.00	0.240	-12.40	62.50	0.348	-9.17	86.00	0.055	-25.19
1.25	0.999	-0.01	16.00	0.641	-3.86	39.50	0.251	-12.01	63.00	0.343	-9.29	86.50	0.048	-26.38
1.50	0.998	-0.02	16.50	0.621	-4.14	40.00	0.262	-11.63	63.50	0.338	-9.42	87.00	0.041	-27.74
1.75	0.997	-0.03	17.00	0.600	-4.44	40.50	0.273	-11.28	64.00	0.334	-9.53	87.50	0.034	-29.37
2.00	0.996	-0.03	17.50	0.579	-4.75	41.00	0.283	-10.96	64.50	0.329	-9.66	88.00	0.027	-31.37
2.25	0.994	-0.05	18.00	0.558	-5.07	41.50	0.293	-10.66	65.00	0.324	-9.79	88.50	0.020	-33.98
2.50	0.993	-0.06	18.50	0.536	-5.42	42.00	0.302	-10.40	65.50	0.318	-9.95	89.00	0.014	-37.08
2.75	0.991	-0.08	19.00	0.515	-5.76	42.50	0.311	-10.14	66.00	0.313	-10.09	89.50	0.007	-43.10
3.00	0.989	-0.10	19.50	0.493	-6.14	43.00	0.319	-9.92	66.50	0.308	-10.23	90.00	0.000	-40.00
3.25	0.986	-0.12	20.00	0.471	-6.54	43.50	0.327	-9.71	67.00	0.302	-10.40			
3.50	0.984	-0.14	20.50	0.449	-6.96	44.00	0.334	-9.53	67.50	0.296	-10.57			
3.75	0.982	-0.16	21.00	0.427	-7.39	44.50	0.341	-9.34	68.00	0.291	-10.72			
4.00	0.979	-0.18	21.50	0.405	-7.85	45.00	0.347	-9.19	68.50	0.285	-10.90			
4.25	0.976	-0.22	22.00	0.383	-8.34	45.50	0.353	-9.04	69.00	0.279	-11.09			
4.50	0.973	-0.24	22.50	0.361	-8.85	46.00	0.359	-8.90	69.50	0.273	-11.28			
4.75	0.969	-0.27	23.00	0.338	-9.42	46.50	0.364	-8.78	70.00	0.267	-11.47			
5.00	0.965	-0.31	23.50	0.316	-10.01	47.00	0.369	-8.66	70.50	0.261	-11.67			
5.25	0.962	-0.34	24.00	0.294	-10.63	47.50	0.373	-8.57	71.00	0.254	-11.90			
5.50	0.958	-0.37	24.50	0.272	-11.31	48.00	0.377	-8.47	71.50	0.248	-12.11			
5.75	0.953	-0.42	25.00	0.251	-12.01	48.50	0.380	-8.40	72.00	0.242	-12.32			
6.00	0.949	-0.45	25.50	0.229	-12.80	49.00	0.383	-8.34	72.50	0.236	-12.54			
6.25	0.944	-0.50	26.00	0.207	-13.68	49.50	0.386	-8.27	73.00	0.229	-12.80			
6.50	0.939	-0.55	26.50	0.186	-14.61	50.00	0.388	-8.22	73.50	0.223	-13.03			

*Preliminary, subject to final design and review.*



POWER DENSITY CALCULATION

PROPOSED WTCT-DT STA REQUEST FOR INTERIM FACILITY  
CHANNEL 30 – MARION, ILLINOIS

Since the FCC considers the possible biological effects of RF transmissions in its environmental determinations, we have studied the matter with respect to this Marion facility. Employing the methods set forth in *OET Bulletin No. 65* and considering a main-lobe effective radiated power of 82.1 kW, an antenna radiation center 121.9 meters above ground, and the specific elevation pattern of the proposed ERI antenna, maximum power density two meters above ground of  $0.019 \text{ mW/cm}^2$  is calculated to occur 90 meters southeast of the base of the tower. Since this is only 5.0 percent of the  $0.38 \text{ mW/cm}^2$  reference for uncontrolled environments (areas with public access) surrounding a facility operating on Channel 30 (566-572 MHz), a grant of this proposal may be considered a minor environmental action with respect to public exposure to non-ionizing electromagnetic radiation.

Further, the station owner will take whatever precautionary steps are necessary, such as reducing power or leaving the air temporarily, to ensure that workers operating in the vicinity of the antenna are not exposed to excessive non-ionizing radiation.