TECHNICAL EXHIBIT
APPLICATION FOR DTV CONSTRUCTION PERMIT
NEW DTV STATION
FACILITY ID: 127407
KNOXVILLE, TENNESSEE
CH 7 55 KW (MAX-DA) 382 M

Technical Narrative

This Technical Exhibit supports an application for construction permit for a new digital operation on DTV channel 7 at Knoxville, Tennessee. This application was prepared pursuant to the Report and Order in MB Docket No. 03-224.[1]

It is proposed to operate on DTV channel 7 with a maximum directional effective radiated power (ERP) of 55 kilowatts and an antenna height above average terrain (HAAT) of 382 meters. It is proposed to employ a *Dielectric THV-11A7-R C160 SM* directional antenna at a radiation center of 310 meters (1,017 feet) above ground level on an existing registered tower.

Figure 1 is a site map for the proposed transmitter site. A sketch of the antenna structure and pertinent elevations are included as Figure 2. The FCC antenna registration number for the existing tower is 1043696. Figure 3 provides specifications for the horizontal and vertical plane relative field patterns for the proposed Dielectric THV-11A7-R C160 SM directional antenna.

[1] See Report and Order in MB Docket Number 03-224, Adopted February 5, 2004, released February 12, 2004.

NTSC/DTV Allocation Considerations

Figure 4 is a DTV channel 7 separation study toward other NTSC and DTV allotments based on a 50 kilometer "buffer". Although the separation requirements are only applicable to new DTV allotments, they can be used as an indication of which stations have the potential of receiving interference from the proposed channel 7 DTV operation.

An interference analysis has been conducted using the procedures outlined in the Commission's OET-69 bulletin, which demonstrates that the proposal complies with the interference protection provisions of Section 73.623(c)(2).[2] Interference calculations for the proposed new DTV operation are summarized below with respect to all authorized NTSC, DTV, and Class A facilities.

Protected Station	Facility	Ch.	City	State	FCC Service Population	Proposed Interference Population*	
WCIQ	LIC	7	MOUNT CHEAHA	AL	2,206,311	27,021	1.23%
WDCO-DT	CP	7	COCHRAN	GA	553,142	NONE	--
WDCO-DT	PLN	7	COCHRAN	GA	553,110	NONE	--
WTVW	LIC	7	EVANSVILLE	IN	763,291	NONE	--
WLJC-DT	LIC	7	BEATTYVILLE	KY	121,963	1,770	1.45%
WLJC-DT	PLN	7	BEATTYVILLE	KY	121,963	NONE	--
WHIO-TV	LIC	7	DAYTON	OH	3,068,806	NONE	--
WSPA-TV	LIC	7	SPARTANBURG	SC	2,510,050	6,171	0.25%
WSPA-TV	CP	7	SPARTANBURG	SC	2,510,050	6,171	0.25%
WDBJ	LIC	7	ROANOKE	VA	1,429,073	131	0.01%
WVLT-TV	CP	8	KNOXVILLE	TN	1,237,511	2,867	0.23%
WVLT-TV	LIC	8	KNOXVILLE	TN	--	NONE	--

*Considers interference "masking" from other NTSC and DTV assignments.

[2] The *du Treil, Lundin & Rackley, Inc.* DTV interference analysis program is based on the program and procedures outlined by the FCC in the Sixth Report and Order; subsequent Memorandum Opinion and Order; and FCC OET Bulletin No. 69. A nominal grid size resolution of 2 km was employed. An Alpha based processor computer system was employed. The results have been found to be in very close agreement with the results of the FCC implementation of OET Bulletin No. 69.

From the above, it is apparent that the proposed DTV operation on channel 7 complies with the Commission's allocation standards towards all authorized NTSC and DTV assignments.

Particular allocation attention was provided to nearby, but not co-located, first adjacent station WVLT-TV on Channel 8. WVLT-TV now operates from a site located 2.7 kilometers (1.7 miles) from the proposed location of this herein DTV Channel 7 facility (which is also the location of the former WVLT-TV facility).[3] Since different antennas are employed, with non-similar vertical plane radiation characteristics, the DTV interference prediction methodology, OET-69, was employed using these actual vertical plane patterns rather than the typical "default" values used in within the aforementioned study.[4] Using this procedure, the following results were obtained:

OET-69 Grid Spacing	Protected Station	Ch.	City	State	FCC Service Population	Proposed Interference Population*	
2 km^2	WVLT-TV	8	Knoxville	TN	1,237,511	2,805	0.23%
1 km^2	WVLT-TV	8	Knoxville	TN	1,237,511	1,592	0.13%
0.5 km^2	WVLT-TV	8	Knoxville	TN	1,237,511	1,701	0.14%

Therefore, even using the stations respective actual vertical plane patterns, the predicted interference to WVLT-TV, using the OET-69 model, is still less than 2 percent of the permitted maximum value. It is also noted that in all three OET-69 grid-spacing scenarios, calculations using the actual vertical plane patterns resulted in less predicted interference than using the default values.

[3] See WVLT-TV License FCC File Number: BLCT-20040220ABY.
[4] The Andrew ATW6V4H vertical plane pattern for WVLT-TV was obtained from their application for construction permit (FCC File Number BPCT-20030203ABW). The patterns were defined every degree from 0° to 90° (degrees are departure angle from horizontal plane).

Class A Allocation Considerations

A study has been conducted which indicates that the new DTV proposal will not be involved in any prohibited contour overlap to any Class A stations.

City Coverage

Figure 5 is a map showing the DTV predicted coverage contours. The map provides the predicted 36 dBu F(50,90) noise-limited contour and 43 dBu F(50,90) city grade contour. The Knoxville city limits were derived from information contained in the 2000 U.S. Census for Tennessee. As indicated, all of Knoxville is located within the proposed 43 dBu contour. The distances to the predicted contours were determined in accordance with the provisions of Section 73.625, except the proposed HAAT was calculated based on 36 evenly spaced radials rather than eight. The average elevations from 3.2 to 16.1 kilometers from the transmitter site were obtained from the NGDC 30-second terrain database and were used for determining the distances to coverage contours.

Objectionable Interference

The only known authorized full service AM station within 5 kilometers (3 miles) of the proposed transmitter site is WNOX on 990 kHz at Knoxville, TN. There are several authorized full service FM and TV stations within 16 kilometers (10 miles) of the proposed site. Although no adverse electromagnetic impact is expected, the applicant recognizes its responsibility to correct problems, which are a result of its proposed operation.

The proposed site is more than 600 kilometers from the closest point of the Canadian border and more than 1600 kilometers from the closest point of the Mexican border. The closest FCC monitoring station is at Power Springs, Georgia

located 249 kilometers to the south. The National Radio Quiet Zone (VA/WV) is 348 kilometers to the east-northeast. The Table Mountain Radio Quiet Zone (CO) is more than 1900 kilometers to the west. The closest radio astronomy site conducting research on TV channel 37 is at Green Bank, West Virginia located 451 kilometers to the northeast. All these separations are considered sufficient to avoid interference from the proposed operation.

Radiofrequency Electromagnetic Field Exposure Analysis

The proposed facility has been evaluated in terms of potential radiofrequency electromagnetic field exposure at ground level in accordance with OET Bulletin No. 65, Evaluating Compliance with FCC Specified Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields[5]. The power density at the base of the tower was calculated using the appropriate procedures contained in the Bulletin.

The proposed DTV antenna will be side-mounted on the existing tower with the antenna center of radiation located 310 meters above ground level. The calculated power density at 2 meters above ground level (AGL) was calculated using the appropriate equation contained in the Bulletin. The vertical relative field pattern and tabulation for the proposed antenna are shown in Figure 2. The maximum vertical relative field value towards the tower base (-50 to –90 elevation) is 0.07. Therefore, using a “worst-case” vertical relative field value of 0.07, the calculated power density at 2 meters above the ground is 0.0001 milliwatts per square centimeter (mW/cm^2), which is less than 1% of the Commission’s recommended limit of 0.2 mW/cm^2 for channel 7, applicable to uncontrolled exposure areas. Therefore, the proposed DTV facility will comply with the FCC’s RF emission rules.

[5] OET Bulletin 65, Second Edition 97-01, August, 1997.

Access to the tower site will be restricted and appropriately marked with warning signs. When it becomes necessary for workers to ascend the tower, appropriate measures, such as reduction or shut down of power if necessary, shall be taken to ensure that the human exposure to radiofrequency electromagnetic fields will not exceed the FCC guidelines.

It is noted that this technical exhibit only addresses the potential for radiofrequency electromagnetic field exposure. All other aspects of the environmental processing analysis will be provided to the FCC by the tower owner as part of the tower registration process.

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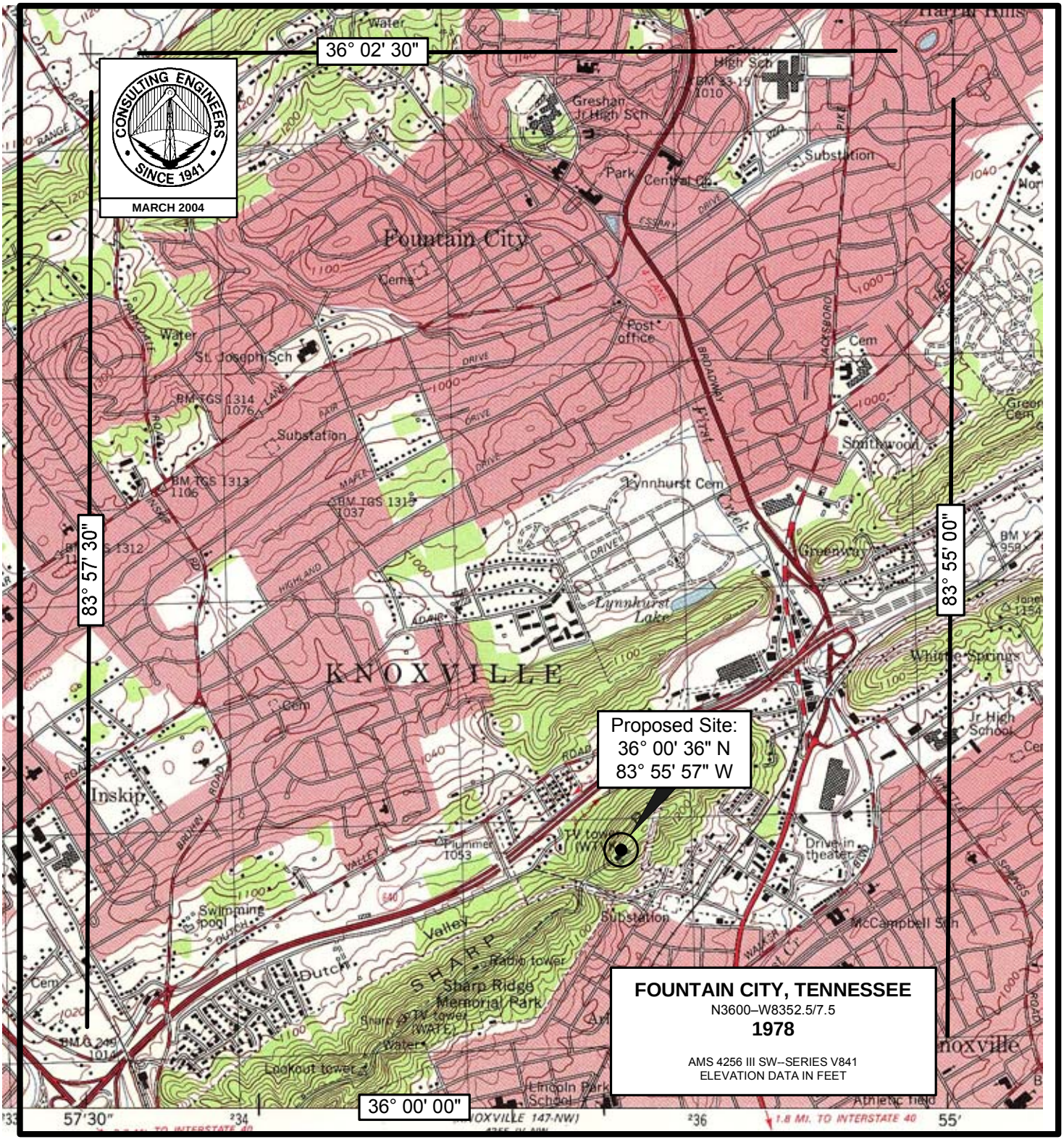
April 20, 2004



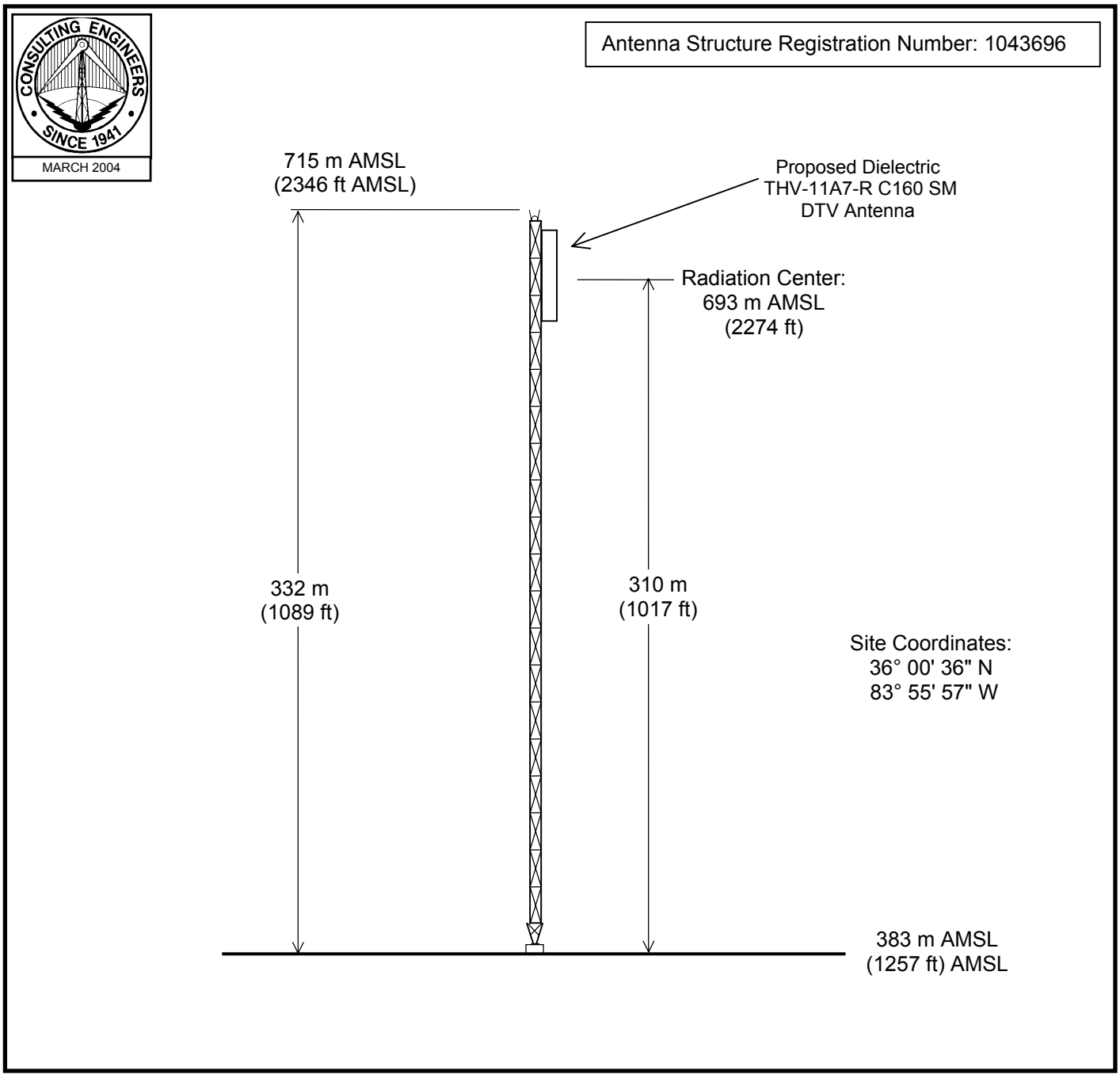
1.0 0.5 0 1.0 miles

0.5 0 0.5 1.0 1.5 2.0 2.5 kilometers

PROPOSED TRANSMITTER SITE

NEW DTV STATION
KNOXVILLE, TENNESSEE
CH 7 55 KW (MAX-DA) 382 M

du Treil, Lundin & Rackley, Inc. Sarasota, Florida



PROPOSED ANTENNA AND SUPPORTING STRUCTURE

NEW DTV STATION

KNOXVILLE, TENNESSEE

CH 7 55 KW (MAX-DA) 382 M

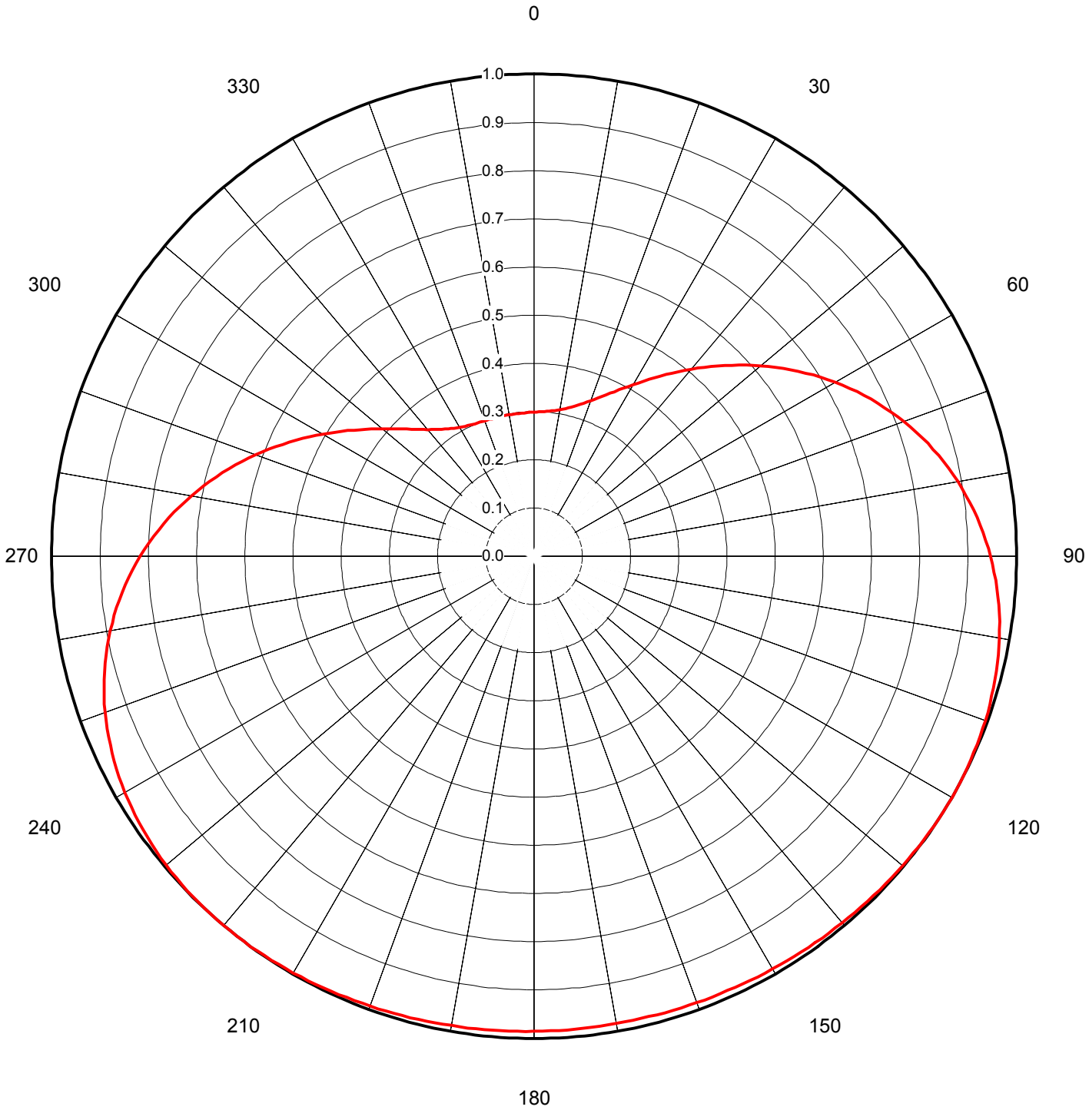
du Treil, Lundin & Rackley, Inc. Sarasota, Florida

Dielectric

Proposal Number	**DCA-10510**	Figure 3, Sheet 1	
Date	**18-Mar-04**		
Call Letters	**NEW**	Channel	**7**
Location	**Knoxville, TN**		
Customer			
Antenna Type	**THV-11A7-R C160 SM**		

AZIMUTH PATTERN

Gain	**1.60**	**(2.04 dB)**	
Calculated / Measured	**Calculated**		
Frequency	**177.00 MHz**		
Drawing #	**THV-C160**		



Dielectric

Proposal Number	**DCA-10510**	Figure 3, Sheet 2	
Date	**18-Mar-04**		
Call Letters	**NEW**	Channel	**7**
Location	**Knoxville, TN**		
Customer			
Antenna Type	**THV-11A7-R C160 SM**		

TABULATION OF AZIMUTH PATTERN

Azimuth Pattern Drawing #: **THV-C160**

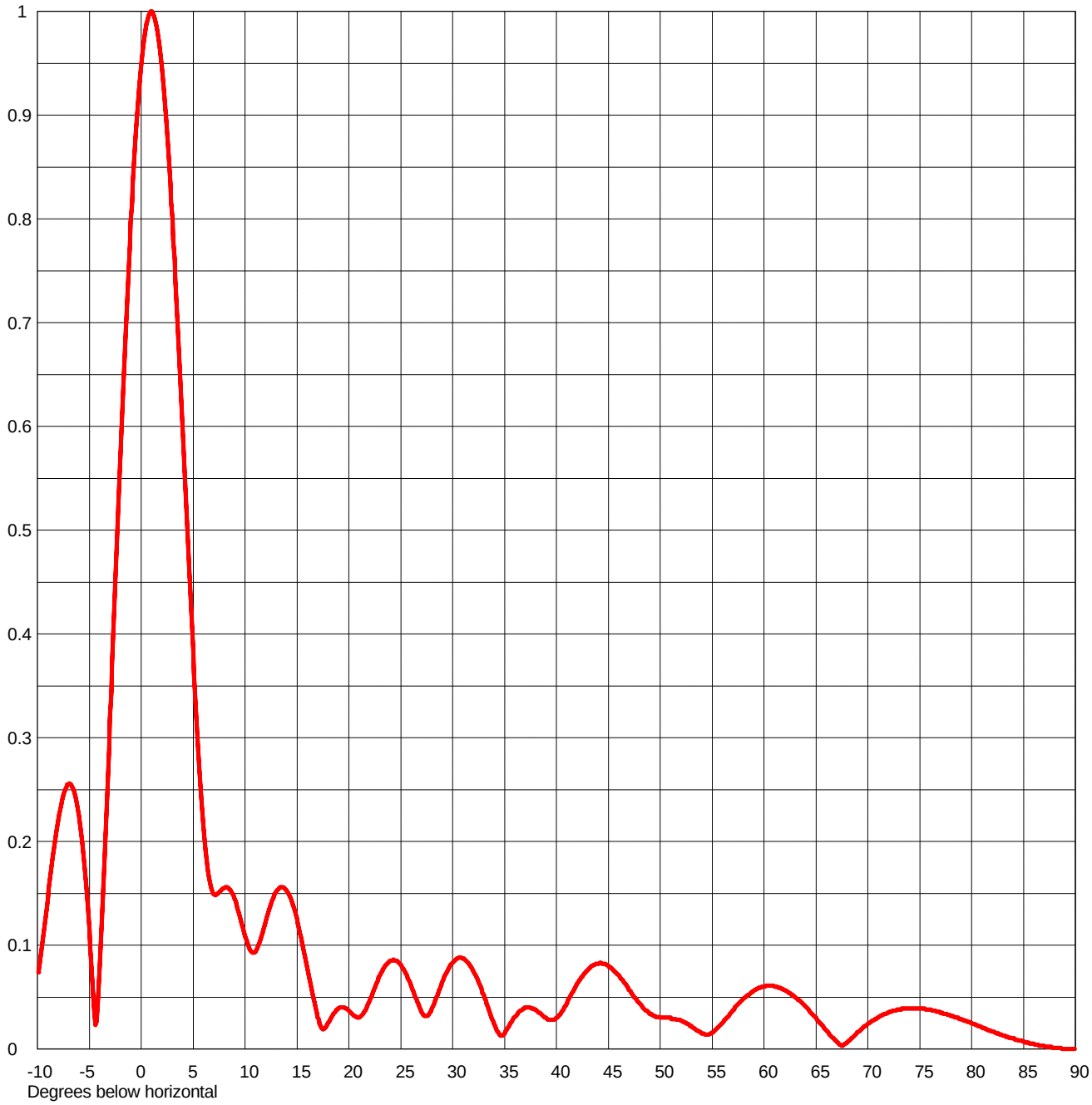
Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
0	0.299	45	0.559	90	0.946	135	0.995	180	0.985	225	0.999	270	0.816	315	0.373
1	0.299	46	0.570	91	0.950	136	0.995	181	0.985	226	0.998	271	0.807	316	0.366
2	0.299	47	0.581	92	0.954	137	0.994	182	0.986	227	0.998	272	0.798	317	0.360
3	0.300	48	0.592	93	0.958	138	0.994	183	0.986	228	0.997	273	0.789	318	0.354
4	0.301	49	0.603	94	0.962	139	0.993	184	0.986	229	0.996	274	0.780	319	0.348
5	0.302	50	0.614	95	0.965	140	0.993	185	0.986	230	0.996	275	0.771	320	0.343
6	0.302	51	0.625	96	0.968	141	0.992	186	0.987	231	0.995	276	0.761	321	0.338
7	0.304	52	0.636	97	0.971	142	0.992	187	0.987	232	0.993	277	0.751	322	0.333
8	0.305	53	0.647	98	0.974	143	0.991	188	0.987	233	0.992	278	0.741	323	0.329
9	0.307	54	0.658	99	0.977	144	0.991	189	0.988	234	0.991	279	0.731	324	0.325
10	0.308	55	0.668	100	0.979	145	0.990	190	0.988	235	0.989	280	0.721	325	0.322
11	0.311	56	0.679	101	0.982	146	0.990	191	0.989	236	0.988	281	0.711	326	0.318
12	0.313	57	0.690	102	0.984	147	0.989	192	0.989	237	0.986	282	0.700	327	0.316
13	0.316	58	0.700	103	0.986	148	0.989	193	0.989	238	0.984	283	0.690	328	0.313
14	0.318	59	0.711	104	0.988	149	0.989	194	0.990	239	0.982	284	0.679	329	0.311
15	0.322	60	0.721	105	0.989	150	0.988	195	0.990	240	0.979	285	0.669	330	0.308
16	0.325	61	0.731	106	0.991	151	0.988	196	0.991	241	0.977	286	0.658	331	0.307
17	0.329	62	0.741	107	0.992	152	0.987	197	0.991	242	0.974	287	0.647	332	0.305
18	0.333	63	0.751	108	0.993	153	0.987	198	0.992	243	0.971	288	0.636	333	0.304
19	0.338	64	0.761	109	0.994	154	0.987	199	0.992	244	0.968	289	0.625	334	0.303
20	0.343	65	0.770	110	0.996	155	0.986	200	0.993	245	0.965	290	0.614	335	0.302
21	0.348	66	0.780	111	0.996	156	0.986	201	0.993	246	0.962	291	0.603	336	0.301
22	0.354	67	0.789	112	0.997	157	0.986	202	0.994	247	0.958	292	0.592	337	0.300
23	0.360	68	0.798	113	0.998	158	0.986	203	0.994	248	0.954	293	0.581	338	0.299
24	0.366	69	0.807	114	0.998	159	0.985	204	0.995	249	0.950	294	0.570	339	0.299
25	0.373	70	0.816	115	0.999	160	0.985	205	0.995	250	0.946	295	0.559	340	0.299
26	0.380	71	0.824	116	0.999	161	0.985	206	0.996	251	0.942	296	0.549	341	0.298
27	0.387	72	0.833	117	1.000	162	0.985	207	0.996	252	0.937	297	0.538	342	0.298
28	0.395	73	0.841	118	1.000	163	0.985	208	0.997	253	0.932	298	0.527	343	0.298
29	0.403	74	0.849	119	1.000	164	0.984	209	0.997	254	0.927	299	0.517	344	0.298
30	0.411	75	0.856	120	1.000	165	0.984	210	0.998	255	0.922	300	0.506	345	0.298
31	0.419	76	0.864	121	1.000	166	0.984	211	0.998	256	0.916	301	0.496	346	0.298
32	0.428	77	0.871	122	1.000	167	0.984	212	0.998	257	0.910	302	0.485	347	0.298
33	0.437	78	0.878	123	1.000	168	0.984	213	0.999	258	0.905	303	0.475	348	0.298
34	0.446	79	0.885	124	1.000	169	0.984	214	0.999	259	0.898	304	0.466	349	0.298
35	0.456	80	0.892	125	0.999	170	0.984	215	0.999	260	0.892	305	0.456	350	0.298
36	0.465	81	0.898	126	0.999	171	0.984	216	1.000	261	0.885	306	0.446	351	0.298
37	0.475	82	0.904	127	0.999	172	0.984	217	1.000	262	0.878	307	0.437	352	0.298
38	0.485	83	0.910	128	0.998	173	0.984	218	1.000	263	0.871	308	0.428	353	0.298
39	0.496	84	0.916	129	0.998	174	0.984	219	1.000	264	0.864	309	0.419	354	0.298
40	0.506	85	0.922	130	0.998	175	0.984	220	1.000	265	0.857	310	0.411	355	0.298
41	0.516	86	0.927	131	0.997	176	0.984	221	1.000	266	0.849	311	0.403	356	0.298
42	0.527	87	0.932	132	0.997	177	0.985	222	1.000	267	0.841	312	0.395	357	0.298
43	0.538	88	0.937	133	0.996	178	0.985	223	1.000	268	0.833	313	0.387	358	0.298
44	0.548	89	0.941	134	0.996	179	0.985	224	0.999	269	0.825	314	0.380	359	0.298

Dielectric

Proposal Number			Figure 3, Sheet 3
Date	**02 Apr 2004**		
Call Letters		Channel	**7**
Location	**Knoxville, TN**		
Customer			
Antenna Type	**THV-11A-R C160 SM**		

ELEVATION PATTERN

RMS Gain at Main Lobe	**11.5 (10.61 dB)**	Beam Tilt	**1.00 Degrees**
RMS Gain at Horizontal	**10.3 (10.13 dB)**	Frequency	**177.00 MHz**
Calculated / Measured	**Calculated**	Drawing #	**11v11510-90**



Remarks:

Dielectric

Proposal Number — Figure 3, Sheet 4
Date **02 Apr 2004**
Call Letters — Channel **7**
Location **Knoxville, TN**
Customer
Antenna Type **THV-11A-R C160 SM**

TABULATION OF ELEVATION PATTERN

Elevation Pattern Drawing # **11v11510-90**

Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.068	2.4	0.896	10.6	0.094	30.5	0.087	51.0	0.030	71.5	0.033
-9.5	0.105	2.6	0.866	10.8	0.093	31.0	0.087	51.5	0.029	72.0	0.035
-9.0	0.146	2.8	0.834	11.0	0.094	31.5	0.083	52.0	0.027	72.5	0.037
-8.5	0.186	3.0	0.799	11.5	0.105	32.0	0.075	52.5	0.025	73.0	0.038
-8.0	0.220	3.2	0.761	12.0	0.123	32.5	0.064	53.0	0.022	73.5	0.039
-7.5	0.245	3.4	0.722	12.5	0.140	33.0	0.052	53.5	0.018	74.0	0.039
-7.0	0.255	3.6	0.681	13.0	0.152	33.5	0.038	54.0	0.015	74.5	0.039
-6.5	0.250	3.8	0.639	13.5	0.156	34.0	0.024	54.5	0.014	75.0	0.039
-6.0	0.225	4.0	0.596	14.0	0.153	34.5	0.014	55.0	0.016	75.5	0.039
-5.5	0.179	4.2	0.552	14.5	0.142	35.0	0.015	55.5	0.020	76.0	0.038
-5.0	0.114	4.4	0.509	15.0	0.125	35.5	0.023	56.0	0.025	76.5	0.037
-4.5	0.035	4.6	0.465	15.5	0.103	36.0	0.031	56.5	0.031	77.0	0.035
-4.0	0.079	4.8	0.423	16.0	0.078	36.5	0.037	57.0	0.037	77.5	0.034
-3.5	0.193	5.0	0.382	16.5	0.053	37.0	0.040	57.5	0.043	78.0	0.032
-3.0	0.318	5.2	0.343	17.0	0.031	37.5	0.040	58.0	0.048	78.5	0.030
-2.8	0.369	5.4	0.306	17.5	0.019	38.0	0.038	58.5	0.052	79.0	0.029
-2.6	0.420	5.6	0.272	18.0	0.025	38.5	0.034	59.0	0.056	79.5	0.027
-2.4	0.472	5.8	0.241	18.5	0.034	39.0	0.030	59.5	0.059	80.0	0.025
-2.2	0.523	6.0	0.214	19.0	0.039	39.5	0.028	60.0	0.060	80.5	0.023
-2.0	0.572	6.2	0.191	19.5	0.040	40.0	0.030	60.5	0.061	81.0	0.021
-1.8	0.621	6.4	0.173	20.0	0.037	40.5	0.036	61.0	0.060	81.5	0.019
-1.6	0.668	6.6	0.161	20.5	0.032	41.0	0.044	61.5	0.059	82.0	0.017
-1.4	0.713	6.8	0.153	21.0	0.030	41.5	0.054	62.0	0.057	82.5	0.015
-1.2	0.756	7.0	0.149	21.5	0.036	42.0	0.063	62.5	0.054	83.0	0.013
-1.0	0.797	7.2	0.148	22.0	0.046	42.5	0.070	63.0	0.050	83.5	0.012
-0.8	0.834	7.4	0.150	22.5	0.059	43.0	0.076	63.5	0.046	84.0	0.010
-0.6	0.868	7.6	0.152	23.0	0.071	43.5	0.080	64.0	0.041	84.5	0.008
-0.4	0.898	7.8	0.154	23.5	0.080	44.0	0.082	64.5	0.035	85.0	0.007
-0.2	0.925	8.0	0.155	24.0	0.085	44.5	0.082	65.0	0.030	85.5	0.006
0.0	0.948	8.2	0.156	24.5	0.085	45.0	0.080	65.5	0.024	86.0	0.005
0.2	0.967	8.4	0.155	25.0	0.081	45.5	0.076	66.0	0.018	86.5	0.003
0.4	0.982	8.6	0.153	25.5	0.073	46.0	0.071	66.5	0.012	87.0	0.003
0.6	0.992	8.8	0.149	26.0	0.061	46.5	0.064	67.0	0.007	87.5	0.002
0.8	0.998	9.0	0.145	26.5	0.048	47.0	0.057	67.5	0.003	88.0	0.001
1.0	1.000	9.2	0.139	27.0	0.036	47.5	0.050	68.0	0.006	88.5	0.001
1.2	0.997	9.4	0.132	27.5	0.032	48.0	0.044	68.5	0.011	89.0	0.000
1.4	0.990	9.6	0.124	28.0	0.039	48.5	0.038	69.0	0.016	89.5	0.000
1.6	0.979	9.8	0.117	28.5	0.051	49.0	0.034	69.5	0.020	90.0	0.000
1.8	0.964	10.0	0.109	29.0	0.064	49.5	0.032	70.0	0.024		
2.0	0.945	10.2	0.103	29.5	0.075	50.0	0.030	70.5	0.027		
2.2	0.922	10.4	0.097	30.0	0.083	50.5	0.030	71.0	0.030		

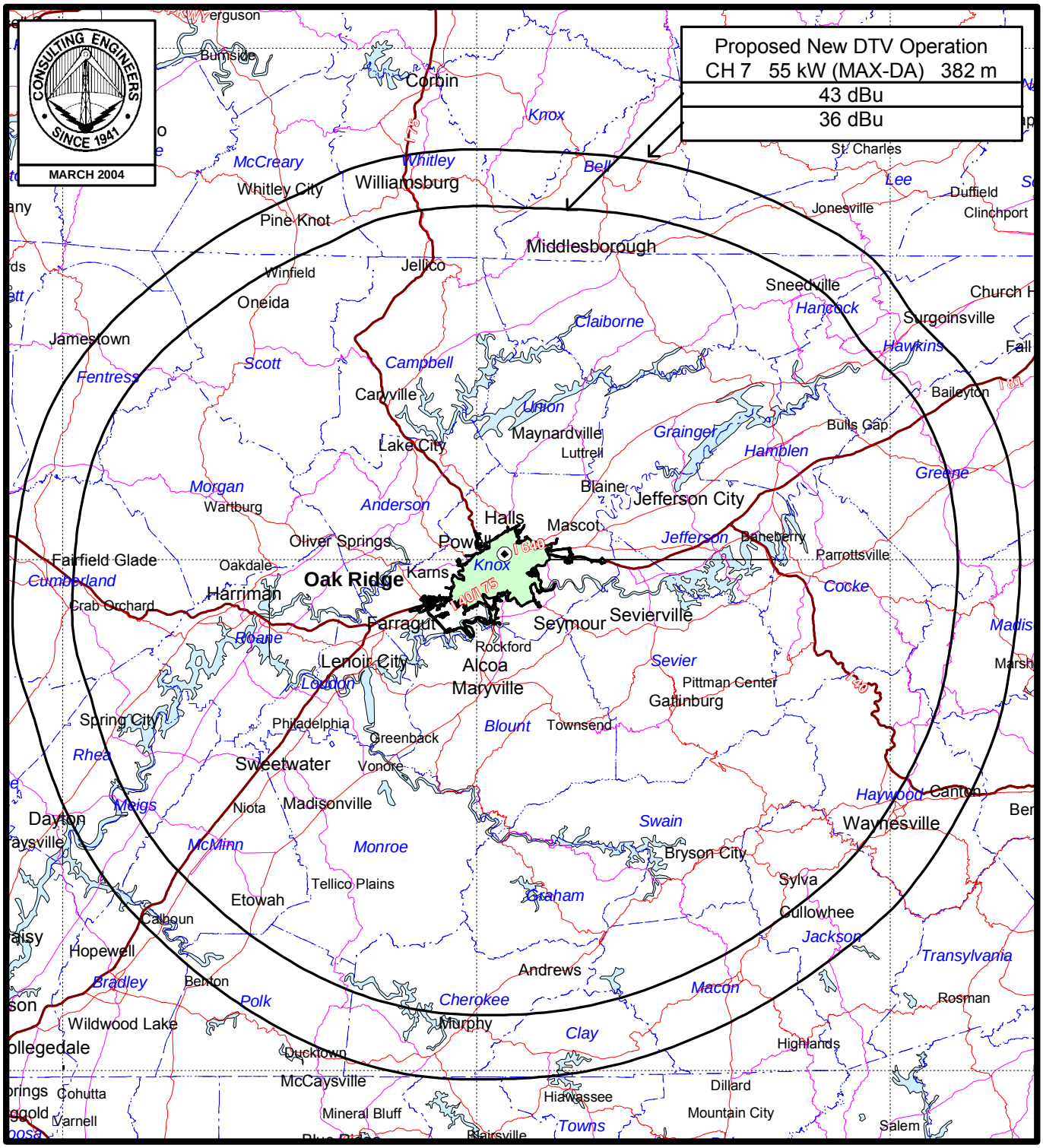
Remarks:

Figure 4

CDBS TV/DTV SEPARATION STUDY

Job Title: New DTV Station — Separation Buffer: 50 km
Channel: 7 — Coordinates: 36-00-36 83-55-57
Class: EX — Zone: II
Type: DT

Call Id	City St	Status	File Num	Channel Zone	ERP HAAT	DA Id	Latitude Longitude	Bear	Dist. (km)	Req. min	Req. max
NEW	KNOXVILLE TN	GRA C	BPRM 20000717AD	7 II	55 367	D 42795	36-00-36 083-55-57	90.0	0.0	273.6	273.6
WSPA-T 66391	SPARTANBURG SC	CP C	BMPCT 20030408AA	7(+) II	265 676	N 59013	35-10-12 082-17-27	121.7	175.6	273.6	273.6
WSPA-T 66391	SPARTANBURG SC	LIC C	BLCT 20030602CC	7(+) II	265 676	N 32916	35-10-12 082-17-27	121.7	175.6	273.6	273.6
DWLJC	BEATTYVILLE KY	DTV		7 II	3.2 197	D	37-36-23 083-41-16	6.9	178.5	273.6	273.6
WLJC-T 27696	BEATTYVILLE KY	LIC C	BLCDT 20030410AB	7 II	28 321.5	N 64201	37-36-47 083-40-18	7.3	179.4	273.6	273.6
WVLT-T 35908	KNOXVILLE TN	LIC C	BLCT 19881223KE	8(Z) II	316 382	D 18702	36-00-36 083-55-57	90.0	0.0	11.0	125.0
WVLT-T 35908	KNOXVILLE TN	CP C	BPCT 20030203AB	8(Z) II	316 509.7	D 46188	35-59-44 083-57-23	233.2	2.7	11.0	125.0



FCC PREDICTED COVERAGE CONTOURS

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KNOXVILLE, TENNESSEE
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du Treil, Lundin & Rackley, Inc., Sarasota, Florida