



## ENGINEERING EXHIBIT

### **Amendment to Application for Minor Modification of Digital Television Station Construction Permit Distributed Transmission System**

prepared for

**University of North Carolina**  
WUNW(DT) Canton, NC  
Ch. 27 Facility ID 83822

*University of North Carolina (“UNC”)* is the licensee of digital television station WUNW, Channel 27, Facility ID 83822, Canton, NC. WUNW is licensed to operate at 50 kW effective radiated power (“ERP”) at an antenna height above average terrain (“HAAT”) of 503 meters (file# BLEDT-20110921AAA). A Construction Permit (“CP” file# 0000036076) authorizes WUNW to operate as a Distributed Transmission System (“DTS”) by adding five transmitter sites to the currently licensed site. *UNC* has submitted an application for minor modification of the DTS CP (file# 0000113389) regarding DTS site number 6 to reduce antenna height and increase ERP. *UNC* herein amends the pending DTS CP modification application to increase ERP and use a different antenna at DTS site number 1.

As authorized in the DTS CP, WUNW will continue to employ its presently licensed transmitting location, which is designated as DTS site number 1. By way of background, the WUNW application for DTS (file# 0000036076) originally specified seven additional sites for a DTS system having eight total sites. That application was later amended to delete site number 3 and site number 8, and the FCC’s Licensing and Management System (“LMS”) record kept the original site numbers for the remaining sites. As a result, the five transmitting sites that were added as DTS sites are numbered in LMS as site 2 and site numbers 4 through 7, to specify the now-authorized DTS system having six total sites.

These five sites added as DTS for WUNW correspond to existing television translator locations utilized by *UNC* that were displaced as a result of the Incentive Auction proceeding.

Substantial terrain blockage exists between all of these sites which prevents service to all areas from a single site and will serve to minimize mutual interference between the DTS sites.

As amended herein, at DTS site number 1 a replacement antenna will be utilized along with an ERP increase to 115 kW. The proposed antenna is an elliptically polarized directional Dielectric model TFU-10DSB/VP-B-R (30 percent vertical polarization). The maximum horizontally polarized ERP is 115 kW and the maximum vertically polarized ERP is 34.5 kW. The vertically polarized component will not exceed the horizontally polarized component at any azimuth. The directional antenna's azimuthal pattern is supplied in Figures 1 and 1A, and the elevation pattern is depicted in Figure 2. The tower structure corresponds to FCC Antenna Structure Registration number 1275765.

A new antenna will be installed at each of the other DTS sites (2 and 4-7). Each will be side-mounted on an existing tower structure and no change in overall tower height will occur. Each of these antennas will be a nondirectional ERI model AL8O-27-E, circularly polarized. The ERP at these sites will range from 0.88 kW to 0.94 kW.

At site 6, the existing DTS CP specifies 0.88 kW ERP and an antenna center of radiation 51.8 meters height above ground level ("AGL") and 298.7 meters HAAT. As proposed herein, an adjacent tower structure will be utilized having a shorter overall height AGL. The antenna at site number 6 will now be centered 33 meters AGL and the resulting HAAT is 279.5 meters. The resulting ERP is increased to 0.94 kW, owing to the reduced length of the transmission line and its associated power loss.

Figure 3 supplies an overview map of the proposed DTS facility noise limited service contours ("NLSC") and the "Table of Distances" radius. Principal community coverage to Canton is provided by DTS site number 1 as demonstrated in Figure 4. In lieu of the standard 103 km radius from the "Table of Distances" in §73.626(c), the "Largest Station" alternative distance is employed herein as described in FCC 08-256.<sup>1</sup> Here, the "Table of Distances" radius may be

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<sup>1</sup>"Digital Television Distributed Transmission System Technologies", Report and Order, MB Docket 05-312, FCC 08-256, released November 7, 2008, at paragraph 35.

extended in order to provide opportunity to achieve the same total coverage area as the largest station within the same market. The station in the same market with the largest NLSC area is WLOS(DT) (Ch. 13, Asheville NC, BLCDT-20101014ABR). The total area within the WLOS NLSC (36 dB $\mu$ ) is 53,210 square kilometers, as depicted in Figure 5. The DTS “Table of Distances” alternative distance specified herein is 130.1 km which encompasses 53,175 square kilometers and does not exceed the area within WLOS’s NLSC.

As demonstrated on Figures 3 and 4, the proposal complies with the requirements of §§73.626(f)(1)-(4) and §73.626(f)(6). The proposed operation covers all of the service area authorized in the underlying WUNW non-DTS CP 0000035959. There is no contour extension beyond the alternative “Table of Distances” radius of 130.1 km. The six DTS transmitter’s coverage contours are contiguous with each other. DTS site number 1 will provide principal community coverage to Canton as required in §73.625(a). Each DTS transmitter site is located within the “Table of Distances” area. The proposed facility’s predicted population exceeds 95 percent of the Incentive Auction<sup>2</sup> baseline facility population.

As to §73.626(f)(5), a detailed interference study per OET Bulletin 69<sup>3</sup> utilizing the “root-sum-square” method shows that the proposal complies with the 0.5 percent limit of new interference caused to pertinent nearby post-auction full service and Class A television stations and reassessments as required by §73.616. **FCC processing of this proposal is requested using a 1.0 km cell size and 0.1 km terrain profile increment.** The interference study output report is provided as Table 1.

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<sup>2</sup>Incentive Auction Closing and Channel Reassignment Public Notice, DA 17-317, released April 13, 2017.

<sup>3</sup>FCC Office of Engineering and Technology Bulletin number 69, *Longley-Rice Methodology for Evaluating TV Coverage and Interference*, February 6, 2004 (“OET-69”). This analysis employed the FCC’s current “TVStudy” software with the default application processing template settings, **1 km cell size, and 0.1 km terrain increment**. Comparisons of various results of this computer program (run on a Mac processor) to the FCCs implementation of TVStudy show excellent correlation.

## Human Exposure to Radiofrequency Electromagnetic Field

The proposed WUNW DTS operation was evaluated for human exposure to RF energy using the procedures outlined in the FCC's OET Bulletin Number 65. At site number 1 and based on OET-65 equation (10), and considering the antenna relative field in downward elevations, the graph in Figure 6 depicts calculated power density levels attributable to the proposed WUNW site number 1 at locations near the site at a height of two meters above ground level. The maximum calculated RF electromagnetic field attributable to the proposed Site 1 facility is 12.2 percent of the general population / uncontrolled MPE limit at any location two meters above ground level, which occurs within 20 meters of the WUNW site number 1 tower location.

Other nonexcluded broadcast facilities are authorized at the same or adjacent tower structures (within 0.1 km). Table 2 supplies a summary of RF signal density calculations for the proposed DTS site 1 operation and the other nearby facilities, for maximum exposure at 2 meters above ground near each emitter's site. Pursuant to §1.1307(b)(1), Part 74 operations at 100 Watts ERP or less are excluded from this evaluation.

Where available, the manufacturer's elevation pattern for each TV antenna was employed with computations per OET-65 equation (10). For FM stations the FCC's "FMModel" computer analysis<sup>4</sup> was utilized with the worst-case setting for antenna type and number of elements. Individual station contributions were determined as a percentage of their respective exposure limit based on operating frequency and then all individual percentages were summed to determine the total RF exposure level. For simplicity in summing the individual RF contributions, these computations assume all stations are located at a single tower location.

Based on this analysis and considering all relevant broadcast facilities, Table 2 shows that the total maximum calculated RF density at two meters above ground level is 80.1 percent of the FCC's uncontrolled / general population MPE limit.

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<sup>4</sup>Public Notice "Office of Engineering and Technology Announces Updates to FMModel Software" DA 16-340, released March 31, 2016.

For site number 2 and numbers 4 through 7, and considering 12 percent antenna relative field in downward elevations (pattern data shows less than 12 percent relative field at angles 25 to 90 degrees below the antenna), the calculated signal density near each tower at two meters above ground level attributable to the proposed DTS facility is less than 0.5 percent of the general population/uncontrolled maximum permitted exposure limit. These results are below the five percent threshold limit described in §1.1307(b) regarding sites with multiple emitters, categorically excluding the applicant from responsibility for taking any corrective action at these locations in the areas where the proposal's contribution is less than five percent.

The general public will not be exposed to RF levels attributable to the proposal in excess of the FCC's guidelines. RF exposure warning signs will be posted. With respect to worker safety, the applicant will coordinate exposure procedures with all pertinent stations and will reduce power or cease operation as necessary to protect persons having access to the sites, towers, or antennas from RF electromagnetic field exposure in excess of FCC guidelines. This exhibit is limited to the evaluation of exposure to RF electromagnetic field. No increase in structure height is proposed at any site.

#### List of Attachments

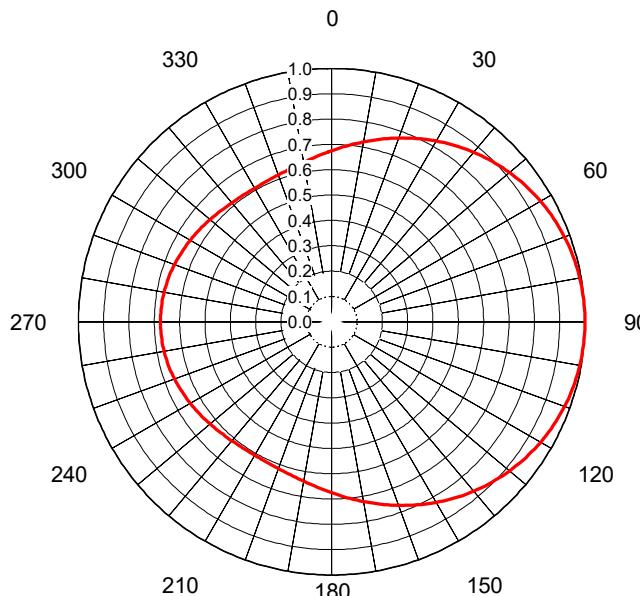
- Figure 1, 1A Antenna Azimuthal Pattern – Site 1
- Figure 2 Antenna Elevation Pattern – Site 1
- Figure 3 Proposed Coverage Contours
- Figure 4 Coverage of Principal Community
- Figure 5 “Table of Distances” Area
- Figure 6 Calculated RF Electromagnetic Field
- Table 1 TVStudy Analysis of Proposal
- Table 2 Site 1: Summary of Radiofrequency Electromagnetic Field Calculations
- Form 2100 Saved Version of Engineering Sections from FCC Form at Time of Upload

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November 27, 2020  
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703-650-9600



### AZIMUTH PATTERN Horizontal Polarization

In Free Space

Proposal No. C-71653  
 Date 24-Nov-20  
 Call Letters WUNW  
 Channel 27  
 Frequency 551 MHz  
 Antenna Type TFU-10DSB/VP-B-R  
 Gain 1.69 (2.27dB)  
 Calculated

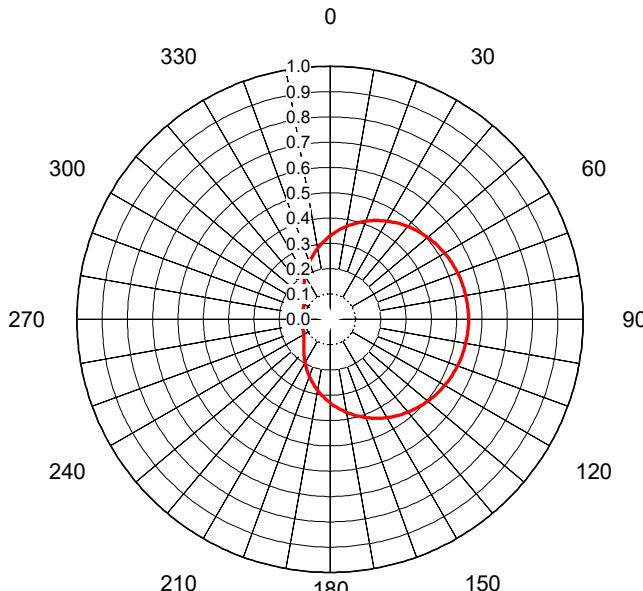
Deg	Value																		
0	0.675	36	0.854	72	0.983	108	0.983	144	0.854	180	0.675	216	0.610	252	0.663	288	0.663	324	0.610
1	0.679	37	0.859	73	0.984	109	0.981	145	0.849	181	0.671	217	0.611	253	0.664	289	0.662	325	0.609
2	0.683	38	0.864	74	0.986	110	0.979	146	0.844	182	0.667	218	0.611	254	0.666	290	0.660	326	0.609
3	0.688	39	0.868	75	0.988	111	0.976	147	0.839	183	0.663	219	0.612	255	0.667	291	0.659	327	0.609
4	0.692	40	0.873	76	0.989	112	0.974	148	0.834	184	0.659	220	0.613	256	0.668	292	0.657	328	0.608
5	0.697	41	0.878	77	0.991	113	0.972	149	0.829	185	0.656	221	0.614	257	0.669	293	0.656	329	0.608
6	0.701	42	0.882	78	0.992	114	0.969	150	0.824	186	0.652	222	0.615	258	0.670	294	0.654	330	0.608
7	0.706	43	0.887	79	0.993	115	0.967	151	0.819	187	0.649	223	0.617	259	0.671	295	0.653	331	0.609
8	0.711	44	0.891	80	0.995	116	0.964	152	0.814	188	0.645	224	0.618	260	0.672	296	0.651	332	0.609
9	0.716	45	0.896	81	0.996	117	0.961	153	0.808	189	0.642	225	0.619	261	0.672	297	0.649	333	0.609
10	0.721	46	0.900	82	0.997	118	0.958	154	0.803	190	0.639	226	0.621	262	0.673	298	0.648	334	0.610
11	0.726	47	0.904	83	0.997	119	0.955	155	0.798	191	0.636	227	0.622	263	0.674	299	0.646	335	0.611
12	0.731	48	0.909	84	0.998	120	0.952	156	0.793	192	0.633	228	0.624	264	0.674	300	0.644	336	0.611
13	0.736	49	0.913	85	0.999	121	0.949	157	0.788	193	0.631	229	0.625	265	0.675	301	0.642	337	0.613
14	0.741	50	0.917	86	0.999	122	0.946	158	0.782	194	0.628	230	0.627	266	0.675	302	0.641	338	0.614
15	0.746	51	0.921	87	0.999	123	0.942	159	0.777	195	0.626	231	0.628	267	0.675	303	0.639	339	0.615
16	0.751	52	0.924	88	1.000	124	0.939	160	0.772	196	0.624	232	0.630	268	0.676	304	0.637	340	0.616
17	0.756	53	0.928	89	1.000	125	0.935	161	0.767	197	0.622	233	0.632	269	0.676	305	0.635	341	0.618
18	0.761	54	0.932	90	1.000	126	0.932	162	0.761	198	0.620	234	0.634	270	0.676	306	0.634	342	0.620
19	0.767	55	0.935	91	1.000	127	0.928	163	0.756	199	0.618	235	0.635	271	0.676	307	0.632	343	0.622
20	0.772	56	0.939	92	1.000	128	0.924	164	0.751	200	0.616	236	0.637	272	0.676	308	0.630	344	0.624
21	0.777	57	0.942	93	0.999	129	0.921	165	0.746	201	0.615	237	0.639	273	0.675	309	0.628	345	0.626
22	0.782	58	0.946	94	0.999	130	0.917	166	0.741	202	0.614	238	0.641	274	0.675	310	0.627	346	0.628
23	0.788	59	0.949	95	0.999	131	0.913	167	0.736	203	0.613	239	0.642	275	0.675	311	0.625	347	0.631
24	0.793	60	0.952	96	0.998	132	0.909	168	0.731	204	0.611	240	0.644	276	0.674	312	0.624	348	0.633
25	0.798	61	0.955	97	0.997	133	0.904	169	0.726	205	0.611	241	0.646	277	0.674	313	0.622	349	0.636
26	0.803	62	0.958	98	0.997	134	0.900	170	0.721	206	0.610	242	0.648	278	0.673	314	0.621	350	0.639
27	0.808	63	0.961	99	0.996	135	0.896	171	0.716	207	0.609	243	0.649	279	0.672	315	0.619	351	0.642
28	0.814	64	0.964	100	0.995	136	0.891	172	0.711	208	0.609	244	0.651	280	0.672	316	0.618	352	0.645
29	0.819	65	0.967	101	0.993	137	0.887	173	0.706	209	0.609	245	0.653	281	0.671	317	0.617	353	0.649
30	0.824	66	0.969	102	0.992	138	0.882	174	0.701	210	0.608	246	0.654	282	0.670	318	0.615	354	0.652
31	0.829	67	0.972	103	0.991	139	0.878	175	0.697	211	0.608	247	0.656	283	0.669	319	0.614	355	0.656
32	0.834	68	0.974	104	0.989	140	0.873	176	0.692	212	0.608	248	0.657	284	0.668	320	0.613	356	0.659
33	0.839	69	0.976	105	0.988	141	0.868	177	0.688	213	0.609	249	0.659	285	0.667	321	0.612	357	0.663
34	0.844	70	0.979	106	0.986	142	0.864	178	0.683	214	0.609	250	0.660	286	0.666	322	0.611	358	0.667
35	0.849	71	0.981	107	0.984	143	0.859	179	0.679	215	0.609	251	0.662	287	0.664	323	0.611	359	0.671

**Figure 1**  
**Antenna Azimuthal Pattern - Site 1**  
**Horizontal Polarization**  
**WUNW(DT) Canton, NC**  
**Ch. 27 Facility ID 83822**

prepared for  
**University of North Carolina**

November, 2020





### AZIMUTH PATTERN Vertical Polarization

In Free Space

Proposal No. C-71653  
 Date 24-Nov-20  
 Call Letters WUNW  
 Channel 27  
 Frequency 551 MHz  
 Antenna Type TFU-10DSB/VP-B-R  
 Gain 2.27 (3.56dB)  
 Calculated

Deg	Value																						
0	0.329	36	0.467	72	0.539	108	0.539	144	0.467	180	0.329	216	0.174	252	0.113	288	0.113	324	0.174	360	0.113	396	0.174
1	0.334	37	0.470	73	0.540	109	0.538	145	0.464	181	0.325	217	0.170	253	0.113	289	0.114	325	0.177	361	0.114	397	0.177
2	0.338	38	0.473	74	0.541	110	0.537	146	0.461	182	0.320	218	0.167	254	0.113	290	0.114	326	0.181	362	0.114	398	0.181
3	0.343	39	0.476	75	0.542	111	0.536	147	0.458	183	0.316	219	0.163	255	0.113	291	0.114	327	0.185	363	0.114	399	0.185
4	0.347	40	0.479	76	0.542	112	0.535	148	0.455	184	0.311	220	0.160	256	0.113	292	0.114	328	0.189	364	0.114	400	0.189
5	0.351	41	0.482	77	0.543	113	0.533	149	0.452	185	0.307	221	0.157	257	0.114	293	0.114	329	0.193	365	0.114	401	0.193
6	0.356	42	0.484	78	0.544	114	0.532	150	0.448	186	0.302	222	0.154	258	0.114	294	0.115	330	0.196	366	0.115	402	0.196
7	0.360	43	0.487	79	0.544	115	0.531	151	0.445	187	0.298	223	0.151	259	0.114	295	0.115	331	0.201	367	0.115	403	0.201
8	0.364	44	0.489	80	0.545	116	0.529	152	0.442	188	0.293	224	0.148	260	0.114	296	0.116	332	0.205	368	0.116	404	0.205
9	0.368	45	0.492	81	0.546	117	0.528	153	0.438	189	0.289	225	0.145	261	0.114	297	0.116	333	0.209	369	0.116	405	0.209
10	0.373	46	0.494	82	0.546	118	0.526	154	0.435	190	0.284	226	0.143	262	0.114	298	0.117	334	0.213	370	0.117	406	0.213
11	0.377	47	0.497	83	0.546	119	0.525	155	0.431	191	0.279	227	0.140	263	0.114	299	0.118	335	0.217	371	0.118	407	0.217
12	0.381	48	0.499	84	0.547	120	0.523	156	0.427	192	0.275	228	0.138	264	0.114	300	0.119	336	0.221	372	0.119	408	0.221
13	0.385	49	0.502	85	0.547	121	0.521	157	0.424	193	0.270	229	0.136	265	0.114	301	0.120	337	0.226	373	0.120	409	0.226
14	0.389	50	0.504	86	0.547	122	0.520	158	0.420	194	0.266	230	0.134	266	0.114	302	0.121	338	0.230	374	0.121	410	0.230
15	0.393	51	0.506	87	0.547	123	0.518	159	0.416	195	0.261	231	0.132	267	0.114	303	0.122	339	0.234	375	0.122	411	0.234
16	0.397	52	0.508	88	0.548	124	0.516	160	0.413	196	0.257	232	0.130	268	0.114	304	0.123	340	0.239	376	0.123	412	0.239
17	0.401	53	0.510	89	0.548	125	0.514	161	0.409	197	0.252	233	0.128	269	0.114	305	0.125	341	0.243	377	0.125	413	0.243
18	0.405	54	0.512	90	0.548	126	0.512	162	0.405	198	0.248	234	0.126	270	0.114	306	0.126	342	0.248	378	0.126	414	0.248
19	0.409	55	0.514	91	0.548	127	0.510	163	0.401	199	0.243	235	0.125	271	0.114	307	0.128	343	0.252	379	0.128	415	0.252
20	0.413	56	0.516	92	0.548	128	0.508	164	0.397	200	0.239	236	0.123	272	0.114	308	0.130	344	0.257	380	0.130	416	0.257
21	0.416	57	0.518	93	0.547	129	0.506	165	0.393	201	0.234	237	0.122	273	0.114	309	0.132	345	0.261	381	0.132	417	0.261
22	0.420	58	0.520	94	0.547	130	0.504	166	0.389	202	0.230	238	0.121	274	0.114	310	0.134	346	0.266	382	0.134	418	0.266
23	0.424	59	0.521	95	0.547	131	0.502	167	0.385	203	0.226	239	0.120	275	0.114	311	0.136	347	0.270	383	0.136	419	0.270
24	0.427	60	0.523	96	0.547	132	0.499	168	0.381	204	0.221	240	0.119	276	0.114	312	0.138	348	0.275	384	0.138	420	0.275
25	0.431	61	0.525	97	0.546	133	0.497	169	0.377	205	0.217	241	0.118	277	0.114	313	0.140	349	0.279	385	0.140	421	0.279
26	0.435	62	0.526	98	0.546	134	0.494	170	0.373	206	0.213	242	0.117	278	0.114	314	0.143	350	0.284	386	0.143	422	0.284
27	0.438	63	0.528	99	0.546	135	0.492	171	0.368	207	0.209	243	0.116	279	0.114	315	0.145	351	0.289	387	0.145	423	0.289
28	0.442	64	0.529	100	0.545	136	0.489	172	0.364	208	0.205	244	0.116	280	0.114	316	0.148	352	0.293	388	0.148	424	0.293
29	0.445	65	0.531	101	0.544	137	0.487	173	0.360	209	0.200	245	0.115	281	0.114	317	0.151	353	0.298	389	0.151	425	0.298
30	0.448	66	0.532	102	0.544	138	0.484	174	0.356	210	0.196	246	0.115	282	0.114	318	0.154	354	0.302	390	0.154	426	0.302
31	0.452	67	0.533	103	0.543	139	0.482	175	0.351	211	0.193	247	0.114	283	0.114	319	0.157	355	0.307	391	0.157	427	0.307
32	0.455	68	0.535	104	0.542	140	0.479	176	0.347	212	0.189	248	0.114	284	0.113	320	0.160	356	0.311	392	0.160	428	0.311
33	0.458	69	0.536	105	0.542	141	0.476	177	0.343	213	0.185	249	0.114	285	0.113	321	0.163	357	0.316	393	0.163	429	0.316
34	0.461	70	0.537	106	0.541	142	0.473	178	0.338	214	0.181	250	0.114	286	0.113	322	0.167	358	0.320	394	0.167	430	0.320
35	0.464	71	0.538	107	0.540	143	0.470	179	0.334	215	0.177	251	0.114	287	0.113	323	0.170	359	0.325	395	0.170	431	0.325

**Figure 1A**  
**Antenna Azimuthal Pattern - Site 1**  
**Vertical Polarization**  
**WUNW(DT) Canton, NC**  
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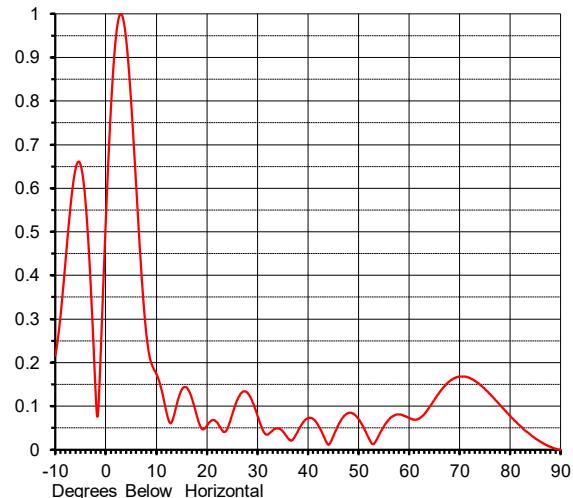
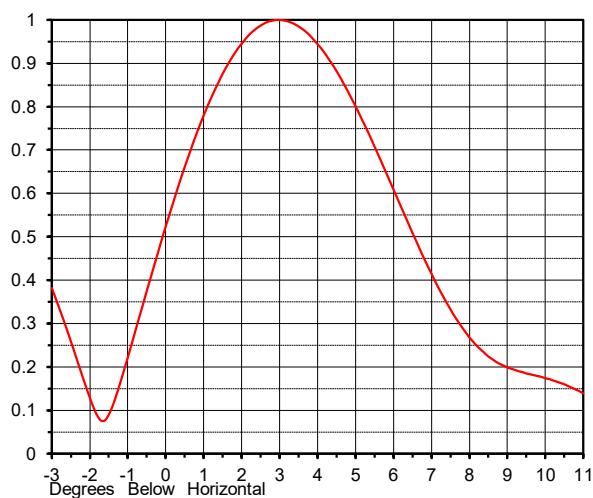
## ELEVATION PATTERN

Proposal No. C-71653  
 Date 24-Nov-20  
 Call Letters WUNW  
 Channel 27  
 Frequency 551 MHz  
 Antenna Type TFU-10DSB/VP-B-R

RMS Directivity at Main Lobe  
 RMS Directivity at Horizontal

**8.1 ( 9.08 dB )**  
**2.2 ( 3.42 dB )**  
 Calculated

Beam Tilt **3.00 deg**  
 Pattern Number **300**



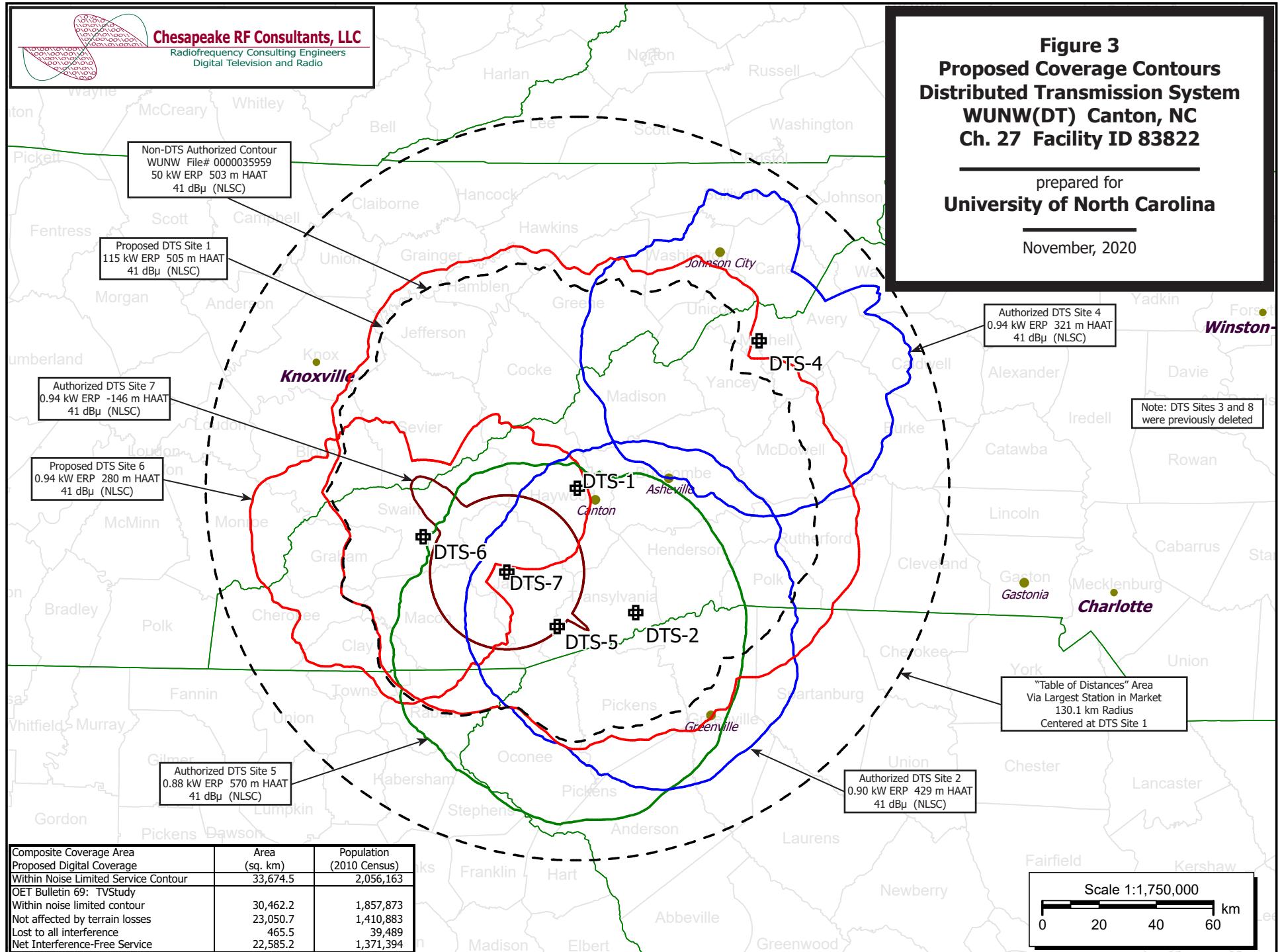
Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.216	10.0	0.174	30.0	0.079	50.0	0.071
-9.0	0.302	11.0	0.139	31.0	0.047	51.0	0.051
-8.0	0.428	12.0	0.087	32.0	0.035	52.0	0.028
-7.0	0.556	13.0	0.063	33.0	0.044	53.0	0.013
-6.0	0.643	14.0	0.102	34.0	0.049	54.0	0.032
-5.0	0.654	15.0	0.137	35.0	0.043	55.0	0.053
-4.0	0.567	16.0	0.143	36.0	0.027	56.0	0.069
-3.0	0.382	17.0	0.119	37.0	0.023	57.0	0.078
-2.0	0.129	18.0	0.079	38.0	0.042	58.0	0.081
-1.0	0.222	19.0	0.048	39.0	0.062	59.0	0.078
0.0	0.524	20.0	0.055	40.0	0.073	60.0	0.073
1.0	0.780	21.0	0.068	41.0	0.071	61.0	0.069
2.0	0.945	22.0	0.063	42.0	0.057	62.0	0.072
3.0	1.000	23.0	0.045	43.0	0.034	63.0	0.081
4.0	0.944	24.0	0.047	44.0	0.012	64.0	0.097
5.0	0.801	25.0	0.080	45.0	0.030	65.0	0.114
6.0	0.609	26.0	0.114	46.0	0.056	66.0	0.131
7.0	0.415	27.0	0.132	47.0	0.075	67.0	0.146
8.0	0.268	28.0	0.131	48.0	0.084	68.0	0.157
9.0	0.199	29.0	0.111	49.0	0.083	69.0	0.164

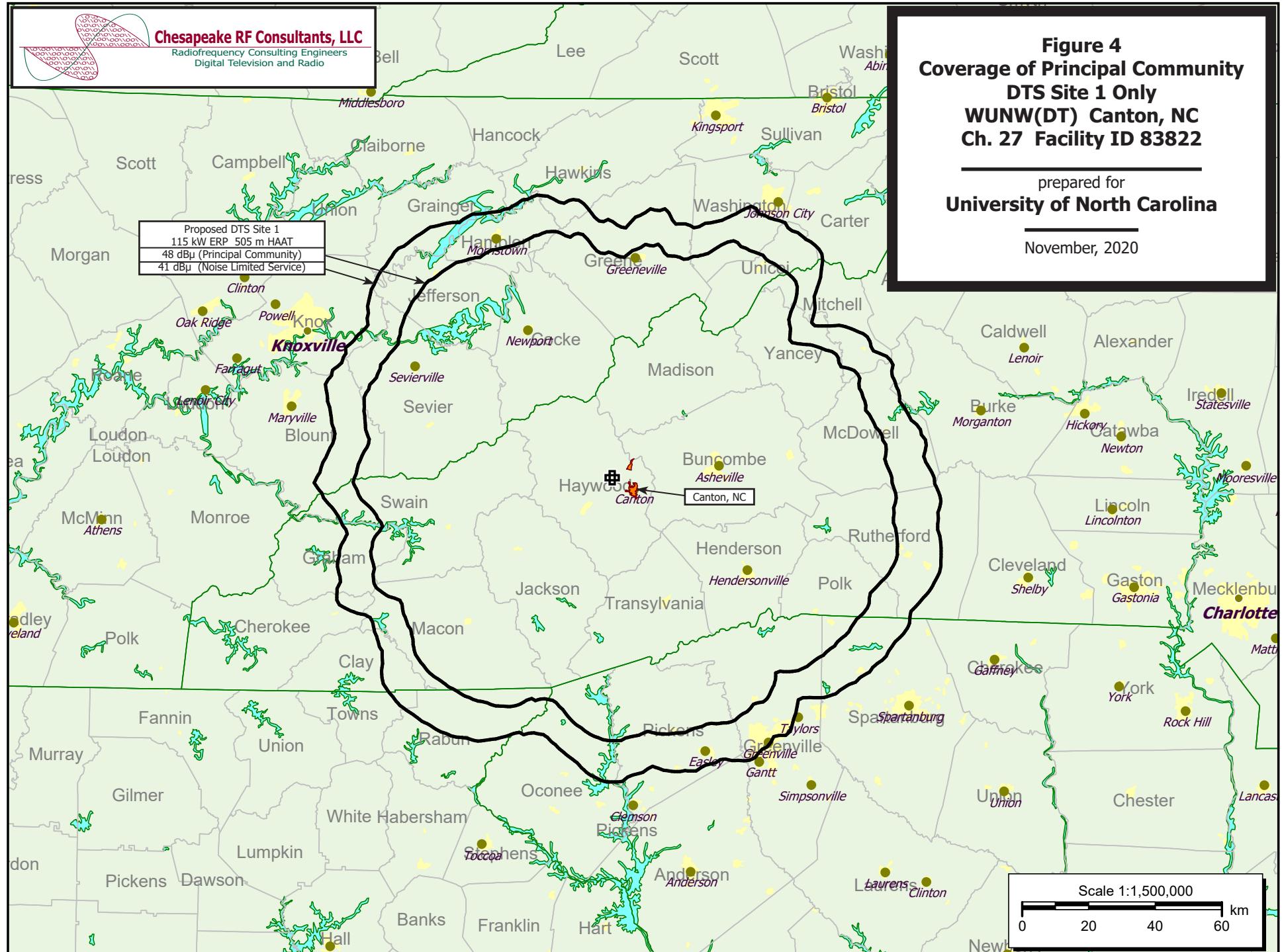


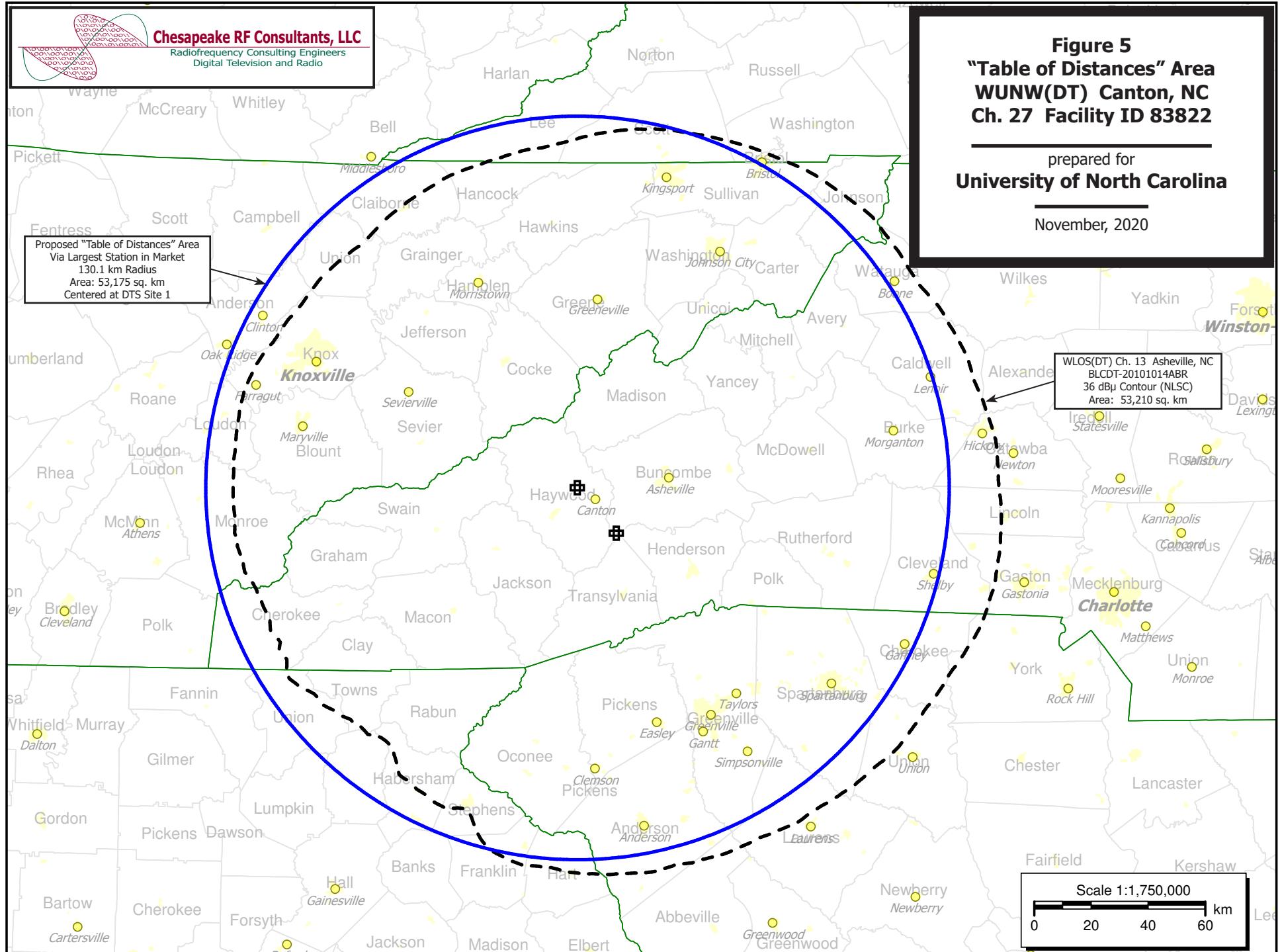
**Figure 2**  
**Antenna Elevation Pattern - Site 1**  
**WUNW(DT) Canton, NC**  
**Ch. 27 Facility ID 83822**

prepared for  
**University of North Carolina**

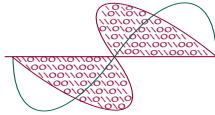
November, 2020







**Figure 5**  
**"Table of Distances" Area**  
**WUNW(DT) Canton, NC**  
**Ch. 27 Facility ID 83822**

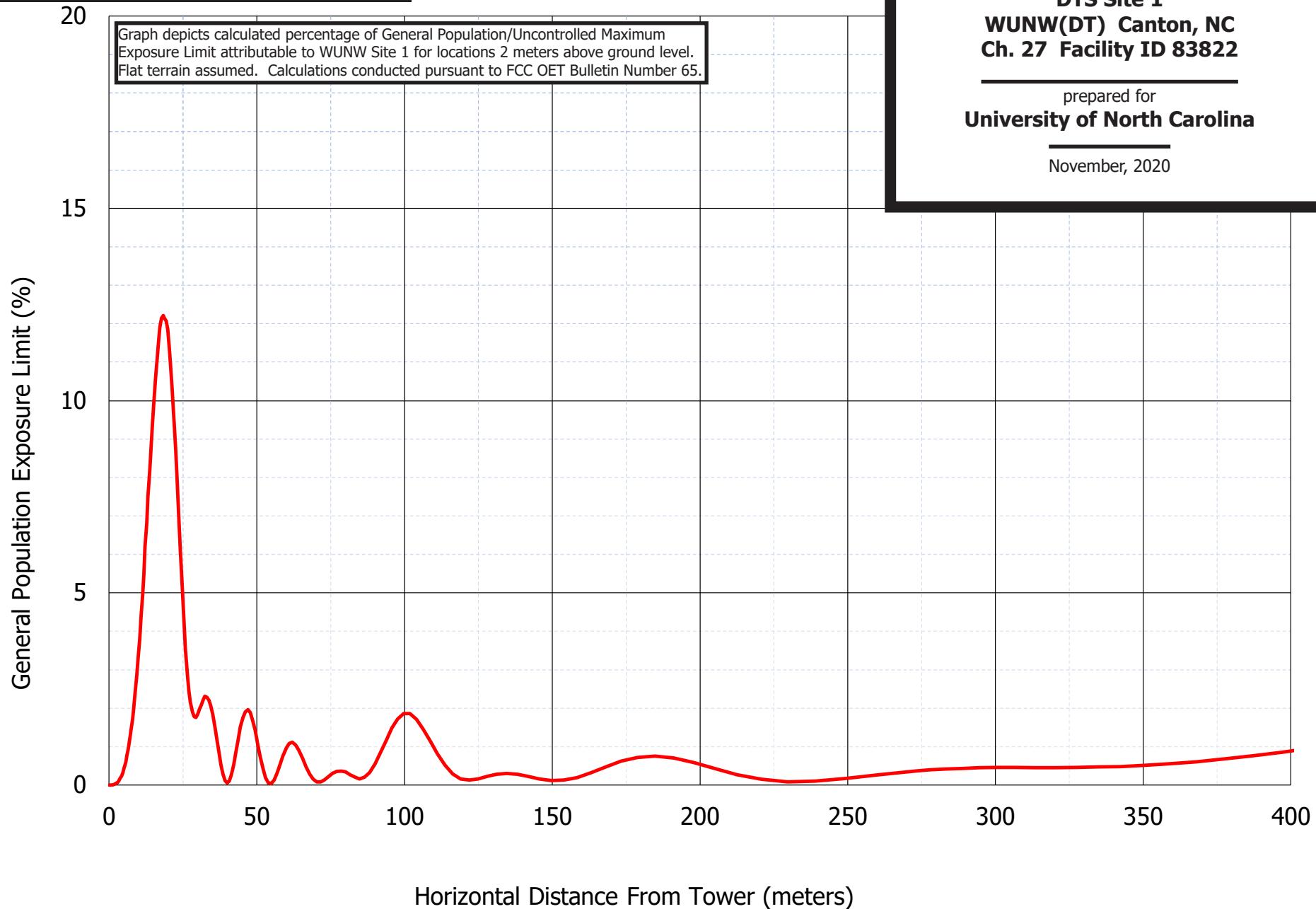


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**Figure 6**  
**Calculated RF Electromagnetic Field**  
**DTS Site 1**  
**WUNW(DT) Canton, NC**  
**Ch. 27 Facility ID 83822**

prepared for  
**University of North Carolina**

November, 2020



**Table 1 WUNW TVStudy Analysis of Proposal**  
(page 1 of 7)



tvstudy v2.2.5 (4uoc83)  
Database: localhost, Study: WUNW DTS-Amd 1.0-0.1, Model: Longley-Rice  
Start: 2020.11.27 11:29:39

Study created: 2020.11.27 11:29:39

Study build station data: LMS TV 2020-11-26

Proposal: WUNW D27 DD APP CANTON, NC  
File number: WUNW DTS-Amd  
Facility ID: 83822  
Station data: User record  
Record ID: 3356  
Country: U.S.  
Zone: II  
Ref. lat.: 35 34 7.00 N  
Ref. long.: 82 54 26.20 W  
# DTS sites: 6

Search options:

Baseline record excluded if station has CP

Stations potentially affected by proposal:

IX	Call	Chan	Svc	Status	City, State	File Number	Distance
No	WNEH	D26	DT	LIC	GREENWOOD, SC	BLANK0000081201	149.1 km
No	WNEH	D26	DT	CP	GREENWOOD, SC	BLANK0000086358	149.1
Yes	WATE-TV	D26	DT	LIC	KNOXVILLE, TN	BMLCDT20041203AEG	105.1
No	WAIQ	D27	DT	LIC	MONTGOMERY, AL	BLEDT20060706ACK	472.0
Yes	WAGA-TV	D27	DT	LIC	ATLANTA, GA	BLCDT20060728AEL	236.1
Yes	WTVQ-DT	D27	DT	LIC	LEXINGTON, KY	BLANK0000087240	304.3
Yes	WGTB-CD	D27	DC	LIC	CHARLOTTE, NC	BLANK0000120552	160.3
No	WUNP-TV	D27	DT	LIC	ROANOKE RAPIDS, NC	BLANK0000121047	463.4
Yes	WPDE-TV	D27	DT	LIC	FLORENCE, SC	BLANK0000120367	352.1
No	WKRN-TV	D27	DT	LIC	NASHVILLE, TN	BLANK0000115874	357.6
Yes	WPXR-TV	D27	DT	LIC	ROANOKE, VA	BLANK0000081460	306.1
No	WJBF	D28	DT	LIC	AUGUSTA, GA	BLANK0000116201	259.7
No	WELF-TV	D28	DT	LIC	DALTON, GA	BLANK0000090766	242.7
Yes	WEWT	D28	DT	LIC	GREENEVILLE, TN	BLANK0000072087	121.5

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied, DTS site # 1:

Channel: D27  
Latitude: 35 34 7.00 N (NAD83)  
Longitude: 82 54 26.20 W  
Height AMSL: 1421.0 m  
HAAT: 504.9 m  
Peak ERP: 115 kW  
Antenna: TFU-10DSB-VP-B-R 20201127 0.0 deg  
Elev Pattrn: Generic  
Elec Tilt: 3.00

40.0 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	52.4 kW	327.6 m	78.4 km
45.0	92.1	436.7	90.3
90.0	115	525.9	98.5
135.0	92.1	495.6	94.2
180.0	52.4	541.4	93.0
225.0	44.2	594.8	94.8
270.0	52.6	504.9	90.4
315.0	44.2	612.4	95.5

Record parameters as studied, DTS site # 2:

Channel: D27  
Latitude: 35 10 36.40 N (NAD83)  
Longitude: 82 40 53.50 W  
Height AMSL: 1192.6 m

**Table 1 WUNW TVStudy Analysis of Proposal**  
 (page 2 of 7)



HAAT: 429.2 m  
 Peak ERP: 0.900 kW  
 Antenna: Omnidirectional  
 Elev Pattrn: Generic  
 Elec Tilt: 1.75

40.0 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	0.900 kW	456.3 m	61.2 km
45.0	0.900	423.3	59.8
90.0	0.900	356.6	56.8
135.0	0.900	509.6	62.9
180.0	0.900	491.1	62.3
225.0	0.900	339.6	56.0
270.0	0.900	450.5	61.0
315.0	0.900	406.3	59.1

Record parameters as studied, DTS site # 4:

Channel: D27  
 Latitude: 36 2 0.40 N (NAD83)  
 Longitude: 82 12 8.50 W  
 Height AMSL: 1276.0 m  
 HAAT: 320.7 m  
 Peak ERP: 0.940 kW  
 Antenna: Omnidirectional  
 Elev Pattrn: Generic  
 Elec Tilt: 1.75

40.0 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	0.940 kW	288.8 m	53.5 km
45.0	0.940	-95.7	28.2
90.0	0.940	257.0	51.7
135.0	0.940	410.0	59.5
180.0	0.940	493.0	62.6
225.0	0.940	440.6	60.9
270.0	0.940	522.3	63.5
315.0	0.940	249.2	51.3

Record parameters as studied, DTS site # 5:

Channel: D27  
 Latitude: 35 7 56.70 N (NAD83)  
 Longitude: 82 59 0.60 W  
 Height AMSL: 1505.6 m  
 HAAT: 570.2 m  
 Peak ERP: 0.880 kW  
 Antenna: Omnidirectional  
 Elev Pattrn: Generic  
 Elec Tilt: 1.75

40.0 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	0.880 kW	392.8 m	58.3 km
45.0	0.880	587.0	64.9
90.0	0.880	687.8	67.5
135.0	0.880	871.4	71.0
180.0	0.880	851.8	70.6
225.0	0.880	440.4	60.5
270.0	0.880	386.7	58.0
315.0	0.880	343.3	56.0

Record parameters as studied, DTS site # 6:

Channel: D27  
 Latitude: 35 24 47.00 N (NAD83)  
 Longitude: 83 30 2.00 W  
 Height AMSL: 1040.0 m  
 HAAT: 279.5 m  
 Peak ERP: 0.940 kW  
 Antenna: Omnidirectional  
 Elev Pattrn: Generic

**Table 1 WUNW TVStudy Analysis of Proposal**  
(page 3 of 7)



Elec Tilt: 1.75

40.0 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	0.940 kW	11.6 m	28.2 km
45.0	0.940	307.8	54.5
90.0	0.940	341.4	56.3
135.0	0.940	130.0	44.1
180.0	0.940	377.7	58.0
225.0	0.940	409.7	59.5
270.0	0.940	452.2	61.3
315.0	0.940	208.6	49.0

Record parameters as studied, DTS site # 7:

Channel: D27  
Latitude: 35 18 12.40 N (NAD83)  
Longitude: 83 10 39.50 W  
Height AMSL: 810.0 m  
HAAT: -146.0 m  
Peak ERP: 0.940 kW  
Antenna: Omnidirectional  
Elev Pattrn: Generic  
Elec Tilt: 1.75

40.0 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	0.940 kW	-99.4 m	28.2 km
45.0	0.940	-386.1	28.2
90.0	0.940	-161.7	28.2
135.0	0.940	-131.1	28.2
180.0	0.940	-213.2	28.2
225.0	0.940	-246.7	28.2
270.0	0.940	-99.8	28.2
315.0	0.940	173.1	47.0

\*\*DTS proposal has coverage outside reference facility and distance limit

Distance to Canadian border: 627.5 km

Distance to Mexican border: 1654.4 km

Conditions at FCC monitoring station: Powder Springs GA

DTS site # 1	Bearing: 221.7 degrees	Distance: 252.0 km
DTS site # 2	Bearing: 232.6 degrees	Distance: 237.3 km
DTS site # 4	Bearing: 224.3 degrees	Distance: 333.2 km
DTS site # 5	Bearing: 229.0 degrees	Distance: 212.9 km
DTS site # 6	Bearing: 213.3 degrees	Distance: 205.5 km
DTS site # 7	Bearing: 221.9 degrees	Distance: 213.7 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:

DTS site # 1	Bearing: 291.2 degrees	Distance: 2017.2 km
DTS site # 2	Bearing: 292.2 degrees	Distance: 2052.3 km
DTS site # 4	Bearing: 289.7 degrees	Distance: 2058.7 km
DTS site # 5	Bearing: 292.5 degrees	Distance: 2028.8 km
DTS site # 6	Bearing: 291.8 degrees	Distance: 1973.6 km
DTS site # 7	Bearing: 292.0 degrees	Distance: 2005.3 km

Study cell size: 1.00 km

Profile point spacing: 0.10 km

Maximum new IX to full-service and Class A: 0.50%  
Maximum new IX to LPTV: 2.00%

-----  
Interference to BMLCDT20041203AEG LIC scenario 1

Desired:	Call	Chan	Svc	Status	City, State
	WATE-TV	D26	DT	LIC	KNOXVILLE, TN

File Number	Distance
BMLCDT20041203AEG	

**Table 1 WUNW TVStudy Analysis of Proposal**

(page 4 of 7)



Undesireds:	WUNW	D27	DT	BL	CANTON, NC	DTVBL83822	105.1 km
	WUNW	D27	DD	APP	CANTON, NC	WUNW DTS-Amd	105.1
	WYHB-CD	D25	DC	LIC	CHATTANOOGA, TN	BLANK0000102891	149.5
	WTJP-TV	D26	DT	LIC	GADSDEN, AL	BLCDT20110304ACB	333.7
	WGXA	D26	DT	LIC	MACON, GA	BLANK0000074961	363.4
	WFIE	D26	DT	LIC	EVANSVILLE, IN	BLANK0000087068	380.4
	WCPO-TV	D26	DT	LIC	CINCINNATI, OH	BLANK0000087181	350.4
	WNEH	D26	DT	LIC	GREENWOOD, SC	BLANK0000081201	242.6
Service area							
43812.0	1,874,498	38389.7	1,687,789	37976.8	IX-free, before 1,674,160	IX-free, after 37966.8	Percent New IX 0.03 0.00
Undesired				Total IX	Unique IX, before	Unique IX, after	
WUNW D27 DT BL		12.9		22	11.9	22	
WUNW D27 DD APP		24.9		22		21.9	22
WYHB-CD D25 DC LIC		3.0		11	2.0	0	0
WTJP-TV D26 DT LIC		192.5		8,928	182.5	8,710	182.5 8,710
WGXA D26 DT LIC		4.0		0	1.0	0	0.0 0
WFIE D26 DT LIC		37.2		739	18.1	520	18.1 520
WCPO-TV D26 DT LIC		182.5		4,155	170.4	4,143	170.4 4,143
WNEH D26 DT LIC		5.0		4	3.0	4	3.0 4
-----							
Interference to BMLCDT20041203AEG LIC scenario 2							
Desired:	Call WATE-TV	Chan D26	Svc DT	Status LIC	City, State KNOXVILLE, TN	File Number BMLCDT20041203AEG	Distance
Undesireds:	WUNW	D27	DT	BL	CANTON, NC	DTVBL83822	105.1 km
	WUNW	D27	DD	APP	CANTON, NC	WUNW DTS-Amd	105.1
	WYHB-CD	D25	DC	LIC	CHATTANOOGA, TN	BLANK0000102891	149.5
	WTJP-TV	D26	DT	LIC	GADSDEN, AL	BLCDT20110304ACB	333.7
	WGXA	D26	DT	LIC	MACON, GA	BLANK0000074961	363.4
	WFIE	D26	DT	LIC	EVANSVILLE, IN	BLANK0000087068	380.4
	WCPO-TV	D26	DT	LIC	CINCINNATI, OH	BLANK0000087181	350.4
	WNEH	D26	DT	CP	GREENWOOD, SC	BLANK0000086358	242.6
Service area				Total IX	Unique IX, before	Unique IX, after	
43812.0	1,874,498	38389.7	1,687,789	37976.8	1,674,160	37966.8	Percent New IX 0.03 0.00
Undesired				Total IX	Unique IX, before	Unique IX, after	
WUNW D27 DT BL		12.9		22	11.9	22	
WUNW D27 DD APP		24.9		22		21.9	22
WYHB-CD D25 DC LIC		3.0		11	2.0	0	0
WTJP-TV D26 DT LIC		192.5		8,928	182.5	8,710	182.5 8,710
WGXA D26 DT LIC		4.0		0	1.0	0	0.0 0
WFIE D26 DT LIC		37.2		739	18.1	520	18.1 520
WCPO-TV D26 DT LIC		182.5		4,155	170.4	4,143	170.4 4,143
WNEH D26 DT CP		5.0		4	3.0	4	3.0 4
-----							
Interference to BLCDT20060728AEL LIC scenario 1							
Desired:	Call WAGA-TV	Chan D27	Svc DT	Status LIC	City, State ATLANTA, GA	File Number BLCDT20060728AEL	Distance
Undesireds:	WUNW	D27	DT	BL	CANTON, NC	DTVBL83822	236.1 km
	WUNW	D27	DD	APP	CANTON, NC	WUNW DTS-Amd	236.1
	WGXA	D26	DT	LIC	MACON, GA	BLANK0000074961	136.9
	WAIQ	D27	DT	LIC	MONTGOMERY, AL	BLEDT20060706ACK	240.9
	WTXL-TV	D27	DT	LIC	TALLAHASSEE, FL	BLCDT20090217ABY	349.5
	WKRN-TV	D27	DT	LIC	NASHVILLE, TN	BLANK0000115874	338.0
	WELF-TV	D28	DT	LIC	DALTON, GA	BLANK0000090766	151.3
Service area				Total IX	Unique IX, before	Unique IX, after	
32716.4	6,001,261	31247.3	5,918,415	30834.4	5,898,071	30492.2	Percent New IX 1.11 0.39
Undesired				Total IX	Unique IX, before	Unique IX, after	
WUNW D27 DT BL		0.0		0	0.0	0	
WUNW D27 DD APP		342.2		22,804		342.2	22,804
WGXA D26 DT LIC		76.8		1,433	73.8	1,111	73.8 1,111
WAIQ D27 DT LIC		248.8		13,410	195.8	8,355	195.8 8,355

**Table 1 WUNW TVStudy Analysis of Proposal**

(page 5 of 7)



WTXL-TV D27 DT LIC	64.9	6,109	35.9	2,601	35.9	2,601
WKRN-TV D27 DT LIC	70.3	4,623	44.2	2,878	44.2	2,878
WELF-TV D28 DT LIC	13.1	223	7.0	146	7.0	146

-----  
Interference to BLANK0000087240 LIC scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WTVQ-DT	D27	DT	LIC	LEXINGTON, KY	BLANK0000087240	
Undesireds:	WUNW	D27	DT	BL	CANTON, NC	DTVBL83822	304.3 km
	WUNW	D27	DD	APP	CANTON, NC	WUNW DTS-Amd	304.3
	WCPO-TV	D26	DT	LIC	CINCINNATI, OH	BLANK0000087181	121.6
	WTTV	D27	DT	LIC	BLOOMINGTON, IN	BLANK0000086972	215.5
	WTTE	D27	DT	LIC	COLUMBUS, OH	BLANK0000111620	242.5
	WKRN-TV	D27	DT	LIC	NASHVILLE, TN	BLANK0000115874	309.0
Service area					Terrain-limited	IX-free, before	
22193.9	990,170	21919.6	986,490	21817.3	984,178	IX-free, after	Percent New IX
						21815.2	984,178
						0.01	0.00
Undesired				Total IX	Unique IX, before	Unique IX, after	
WUNW D27 DT BL		0.0		0	0.0	0	
WUNW D27 DD APP		3.0		63		2.0	0
WCPO-TV D26 DT LIC		15.0		155	10.0	143	10.0
WTTV D27 DT LIC		13.1		1,088	8.0	156	8.0
WTTE D27 DT LIC		54.3		1,547	43.2	603	43.2
WKRN-TV D27 DT LIC		34.1		1,289	30.0	466	403

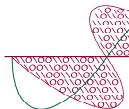
-----  
Interference to BLANK0000120552 LIC scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WGTB-CD	D27	DC	LIC	CHARLOTTE, NC	BLANK0000120552	
Undesireds:	WUNW	D27	DT	BL	CANTON, NC	DTVBL83822	160.3 km
	WUNW	D27	DD	APP	CANTON, NC	WUNW DTS-Amd	160.3
	WNEH	D26	DT	LIC	GREENWOOD, SC	BLANK0000081201	143.7
	WPDE-TV	D27	DT	LIC	FLORENCE, SC	BLANK0000120367	199.8
	WMYV	D28	DT	LIC	GREENSBORO, NC	BLANK0000119626	132.8
Service area				Terrain-limited	IX-free, before	IX-free, after	
10565.4	2,240,093	10482.8	2,233,555	10441.9	2,224,519	10418.0	2,223,865
						0.23	0.03
Undesired				Total IX	Unique IX, before	Unique IX, after	
WUNW D27 DT BL		1.0		0	1.0	0	
WUNW D27 DD APP		28.9		1,041		24.9	654
WPDE-TV D27 DT LIC		38.9		8,777	38.9	8,777	34.9
WMYV D28 DT LIC		1.0		259	1.0	259	1.0

-----  
Interference to BLANK0000120367 LIC scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WPDE-TV	D27	DT	LIC	FLORENCE, SC	BLANK0000120367	
Undesireds:	WUNW	D27	DT	BL	CANTON, NC	DTVBL83822	352.1 km
	WUNW	D27	DD	APP	CANTON, NC	WUNW DTS-Amd	352.1
	WGTB-CD	D27	DC	LIC	CHARLOTTE, NC	BLANK0000120552	199.8
	WUNP-TV	D27	DT	LIC	ROANOKE RAPIDS, NC	BLANK0000121047	253.1
	WPXR-TV	D27	DT	LIC	ROANOKE, VA	BLANK0000081460	323.3
	WMYV	D28	DT	LIC	GREENSBORO, NC	BLANK0000119626	172.6
	WHMC	D28	DT	LIC	CONWAY, SC	BLANK0000115805	50.7
Service area				Terrain-limited	IX-free, before	IX-free, after	
40544.7	1,771,899	40326.2	1,765,207	39768.5	1,746,975	39767.5	1,746,965
						0.00	0.00
Undesired				Total IX	Unique IX, before	Unique IX, after	
WUNW D27 DT BL		0.0		0	0.0	0	
WUNW D27 DD APP		10.0		101		1.0	10
WGTB-CD D27 DC LIC		253.9		2,458	195.9	1,817	189.9
WUNP-TV D27 DT LIC		217.4		12,844	144.6	10,961	144.6
WPXR-TV D27 DT LIC		109.8		2,724	23.0	1,322	23.0
WMYV D28 DT LIC		45.8		2,796	16.9	1,810	16.9

**Table 1 WUNW TVStudy Analysis of Proposal**  
(page 6 of 7)



**Chesapeake RF Consultants, LLC**

Radiofrequency Consulting Engineers  
Digital Television and Radio

WHMC D28 DT LIC 75.5 0 75.5 0 75.5 0

Interference to BLANK0000081460 LIC scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	WPXR-TV	D27	DT	LIC	ROANOKE, VA	BLANK0000081460	
Undesireds:	WUNW	D27	DT	BL	CANTON, NC	DTVBL83822	306.1 km
	WUNW	D27	DD	APP	CANTON, NC	WUNW DTS-Amd	306.1
	WGFX-TV	D26	DT	LIC	BURLINGTON, NC	BLANK0000081829	150.2
	WHTJ	D26	DT	LIC	CHARLOTTESVILLE, VA	BLANK0000112378	170.7
	WTVO-DT	D27	DT	LIC	LEXINGTON, KY	BLANK0000087240	385.0
	WMAR-TV	D27	DT	LIC	BALTIMORE, MD	BLANK0000120189	386.8
	WGTB-CD	D27	DC	LIC	CHARLOTTE, NC	BLANK0000120552	223.1
	WUNP-TV	D27	DT	LIC	ROANOKE RAPIDS, NC	BLANK0000121047	229.4
	WTTE	D27	DT	LIC	COLUMBUS, OH	BLANK0000111620	393.5
	WTAE-TV	D27	DT	LIC	PITTSBURGH, PA	BLANK0000112576	343.8
	WPDE-TV	D27	DT	LIC	FLORENCE, SC	BLANK0000120367	323.3
	WMYV	D28	DT	LIC	GREENSBORO, NC	BLANK0000119626	150.8
	WEMT	D28	DT	LIC	GREENEVILLE, TN	BLANK0000072087	193.1

Service area	Terrain-limited	IX-free, before	IX-free, after	Percent New IX
39002.8 1,375,927	34863.3 1,252,066	34287.8 1,231,644	34284.8 1,231,583	0.01 0.00

Undesired	Total	IX	Unique IX, before	Unique IX, after
WUNW D27 DT BL	1.0	0	1.0	0
WUNW D27 DD APP	4.0	61		4.0
WGPX-TV D26 DT LIC	15.1	134	1.0	0
WHTJ D26 DT LIC	6.1	39	2.0	1
WTVQ-DT D27 DT LIC	8.0	176	7.0	176
WMAR-TV D27 DT LIC	23.3	463	16.2	258
WGTB-CD D27 DC LIC	40.2	815	25.1	274
WUNP-TV D27 DT LIC	374.4	15,529	312.1	11,699
WTTE D27 DT LIC	17.2	175	12.1	74
WTAE-TV D27 DT LIC	7.1	101	2.0	0
WPDE-TV D27 DT LIC	51.2	1,069	16.0	243
WMYV D28 DT LIC	142.7	6,979	97.5	3,654
WEMT D28 DT LIC	4.0	0	4.0	0

Interference to BLANK0000072087 LIC scenario 1

Desired:	Call WEMT	Chan D28	Svc DT	Status LIC	City, State GREENEVILLE, TN	File Number BLANK0000072087	Distance
Undesireds:	WUNW	D27	DT	BL	CANTON, NC	DTVBL83822	121.4 km
	WUNW	D27	DD	APP	CANTON, NC	WUNW DTS-Amd	121.5
	WPXR-TV	D27	DT	LIC	ROANOKE, VA	BLANK0000081460	193.1
	WJBF	D28	DT	LIC	AUGUSTA, GA	BLANK0000116201	339.2
	WELF-TV	D28	DT	LIC	DALTON, GA	BLANK0000090766	349.4
	WLEX-TV	D28	DT	LIC	LEXINGTON, KY	BLANK0000087372	268.2
	WMYV	D28	DT	LIC	GREENSBORO, NC	BLANK0000119626	215.0
	WSYX	D28	DT	LIC	COLUMBUS, OH	BLANK0000087264	395.8
	WKOP-TV	D29	DT	LIC	KNOXVILLE, TN	BLANK0000081273	173.2
Service area		Terrain-limited		IX-free, before		IX-free, after	
41491.6	1,727,017	35673.1	1,349,665	35348.1	1,338,180	35322.9	1,337,248
Percent		New IX					
Undesired		Total IX		Unique IX, before		Unique IX, after	
WUNW D27 DT BL	11.9	0		8.0	0		
WUNW D27 DD APP	36.1	932				33.1	932
WPXR-TV D27 DT LIC	13.0	154		7.0	0	7.0	0
WJBF D28 DT LIC	9.1	9		4.0	9	4.0	9
WELF-TV D28 DT LIC	26.2	827		21.1	200	21.1	200
WLEX-TV D28 DT LIC	85.6	2,209		77.5	1,617	77.5	1,617
WMYV D28 DT LIC	118.5	3,382		100.5	2,636	101.4	2,636
WSYX D28 DT LIC	13.2	564		7.1	0	7.1	0
WKOP-TV D29 DT LIC	77.7	6,277		72.7	5,650	72.7	5,650

### Interference to proposal scenario 1

2.80% interference received

**Table 1 WUNW TVStudy Analysis of Proposal**  
 (page 7 of 7)



Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WUNW	D27	DD	APP	CANTON, NC	WUNW DTS-Amd	
Undesireds:	WNEH	D26	DT	LIC	GREENWOOD, SC	BLANK0000081201	149.1 km
	WATE-TV	D26	DT	LIC	KNOXVILLE, TN	BMLCDT20041203AEG	105.1
	WAGA-TV	D27	DT	LIC	ATLANTA, GA	BLCDT20060728AEL	236.1
	WTVO-DT	D27	DT	LIC	LEXINGTON, KY	BLANK0000087240	304.3
	WGTB-CD	D27	DC	LIC	CHARLOTTE, NC	BLANK0000120552	160.3
	WPDE-TV	D27	DT	LIC	FLORENCE, SC	BLANK0000120367	352.1
	WKRN-TV	D27	DT	LIC	NASHVILLE, TN	BLANK0000115874	357.6
	WPXR-TV	D27	DT	LIC	ROANOKE, VA	BLANK0000081460	306.1
	WEMT	D28	DT	LIC	GREENEVILLE, TN	BLANK0000072087	121.5
Service area		Terrain-limited			IX-free	Percent IX	
30462.2	1,857,873	23050.7	1,410,883	22585.2	1,371,394	2.02	2.80
Undesired		Total IX			Unique IX	Prcnt Unique IX	
WNEH D26 DT LIC		8.0	445	2.0	0	0.01	0.00
WATE-TV D26 DT LIC		73.7	10,822	67.6	10,290	0.29	0.73
WAGA-TV D27 DT LIC		240.6	18,291	177.8	13,487	0.77	0.96
WTVO-DT D27 DT LIC		31.3	2,459	12.1	378	0.05	0.03
WGTB-CD D27 DC LIC		129.6	10,275	59.8	3,935	0.26	0.28
WPDE-TV D27 DT LIC		58.8	5,897	7.0	479	0.03	0.03
WKRN-TV D27 DT LIC		1.0	143	0.0	0	0.00	0.00
WPXR-TV D27 DT LIC		29.0	1,104	16.9	793	0.07	0.06
WEMT D28 DT LIC		33.3	2,775	20.2	1,462	0.09	0.10

Interference to proposal scenario 2

2.80% interference received

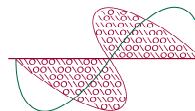
Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WUNW	D27	DD	APP	CANTON, NC	WUNW DTS-Amd	
Undesireds:	WNEH	D26	DT	CP	GREENWOOD, SC	BLANK0000086358	149.1 km
	WATE-TV	D26	DT	LIC	KNOXVILLE, TN	BMLCDT20041203AEG	105.1
	WAGA-TV	D27	DT	LIC	ATLANTA, GA	BLCDT20060728AEL	236.1
	WTVO-DT	D27	DT	LIC	LEXINGTON, KY	BLANK0000087240	304.3
	WGTB-CD	D27	DC	LIC	CHARLOTTE, NC	BLANK0000120552	160.3
	WPDE-TV	D27	DT	LIC	FLORENCE, SC	BLANK0000120367	352.1
	WKRN-TV	D27	DT	LIC	NASHVILLE, TN	BLANK0000115874	357.6
	WPXR-TV	D27	DT	LIC	ROANOKE, VA	BLANK0000081460	306.1
	WEMT	D28	DT	LIC	GREENEVILLE, TN	BLANK0000072087	121.5
Service area		Terrain-limited			IX-free	Percent IX	
30462.2	1,857,873	23050.7	1,410,883	22585.2	1,371,394	2.02	2.80
Undesired		Total IX			Unique IX	Prcnt Unique IX	
WNEH D26 DT CP		8.0	445	2.0	0	0.01	0.00
WATE-TV D26 DT LIC		73.7	10,822	67.6	10,290	0.29	0.73
WAGA-TV D27 DT LIC		240.6	18,291	177.8	13,487	0.77	0.96
WTVO-DT D27 DT LIC		31.3	2,459	12.1	378	0.05	0.03
WGTB-CD D27 DC LIC		129.6	10,275	59.8	3,935	0.26	0.28
WPDE-TV D27 DT LIC		58.8	5,897	7.0	479	0.03	0.03
WKRN-TV D27 DT LIC		1.0	143	0.0	0	0.00	0.00
WPXR-TV D27 DT LIC		29.0	1,104	16.9	793	0.07	0.06
WEMT D28 DT LIC		33.3	2,775	20.2	1,462	0.09	0.10

Table 2

**Site 1: Summary of Radiofrequency  
Electromagnetic Field Calculations**

Prepared November 2020 for

**University of North Carolina (WUNW)**



**Chesapeake RF Consultants, LLC**

Radiofrequency Consulting Engineers  
Digital Television and Radio

**WUNW Site 1 Facility with Nearby Nonexcluded TV and FM Broadcast Emitters**

Facility	Channel	ERP (kW)	Polarization	Relative Field	Height (meters)	S - Calculated ( $\mu\text{W}/\text{cm}^2$ )	S - Limit ( $\mu\text{W}/\text{cm}^2$ )	Percent of Limit
WUNW Canton NC Proposed Site 1	27	115	E	See Graph Figure 6	55.0	44.9	367.3	12.2%
W10DF-D Canton, NC Lic 0000088840	10	0.13	H	0.30	17.0	1.7	200	0.9%
W23EY-D Canton, NC Lic 0000087276	23	5	H	0.20	17.0	29.7	351.3	8.5%
W26FB-D CantonWaynesvl NC Lic 0000080640	26	15	H	0.227	12.2 (slant)	173.6	363.3	47.8%
W264DT Clyde NC CP BNPFT-20180731AAA	264	0.20	V	FMMModel at Worst case	27.0	3.5	200	1.8%
W269DK Canton, NC Lic BLFT-20180207AAJ	269	0.16	C	FMMModel at Worst case	23.0	17.8	200	8.9%
<b>Total Calculated Signal Density:</b>								<b>80.1%</b>

ERP: Effective Radiated Power  
 Polarization: H – Horizontal; V – Vertical; E – Elliptical; C – Circular  
 Field: Elevation Pattern Relative Field Value  
 Height: Height of radiation center above ground level  
 S-Calc: OET Bulletin 65 calculated value of signal density at two meters above ground level  
 S-Limit: §1.1310 uncontrolled/general population limit for signal density

<b>Channel and Facility Information</b>	<b>Section</b>	<b>Question</b>	<b>Response</b>
	Facility ID	83822	
	State	North Carolina	
	City	CANTON	
	DTS Channel	27	
	<b>Facility Type</b>	Facility Type	Noncommercial Educational
		Station Type	Main
	<b>Zone</b>	Zone	2

<b>DTS Reference Point</b>	<b>Section</b>	<b>Question</b>	<b>Response</b>
	<b>Construction Permit File Number and Facility ID</b>	File Number for Current Authorized Service Area:	BLEDT-20110921AAA
		Facility ID	83822
	<b>Coordinates (NAD83)</b>	Latitude	35° 34' 07.0" N+
		Longitude	082° 54' 26.2" W-

**Site 1: Antenna Location Data**

Section	Question	Response
<b>Antenna Structure Registration</b>	Do you have an FCC Antenna Structure Registration (ASR) Number?	Yes
	ASR Number	1275765
<b>Coordinates (NAD83)</b>	Latitude	35° 34' 07.0" N+
	Longitude	082° 54' 26.2" W-
	Structure Type	TOWER-A free standing or guyed struct
	Overall Structure Height	59.0 meters
	Support Structure Height	59.0 meters
	Ground Elevation (AMSL)	1366.0 meters
<b>Antenna Data</b>	Height of Radiation Center Above Ground Level	55 meters
	Height of Radiation Center Above Average Terrain	504.9 meters
	Height of Radiation Center Above Mean Sea Level	1421.0 meters
	Effective Radiated Power	115 kW

Site 1: Antenna Technical Data	Section	Question	Response
	Antenna Type	Antenna Type	Directional Custom
		Do you have an Antenna ID?	No
		Antenna ID	
	Antenna Manufacturer and Model	Manufacturer:	Dielectric
		Model	TFU-10DSB/VP-B-R
		Electrical Beam Tilt	3
		Mechanical Beam Tilt	Not Applicable
		toward azimuth	
		Polarization	Elliptical
	DTV and DTS: Elevation Pattern	Does the proposed antenna propose elevation radiation patterns that vary with azimuth for reasons other than the use of mechanical beam tilt?	No
		Rotation	0 degrees
		Uploaded file for elevation antenna (or radiation) pattern data	

#### Directional Antenna Relative Field Values (Pre-rotated Pattern)

Degree	Value	Degree	Value	Degree	Value	Degree	Value
0	0.675	90	1.000	180	0.675	270	0.676
10	0.721	100	0.995	190	0.639	280	0.672
20	0.772	110	0.979	200	0.616	290	0.660
30	0.824	120	0.952	210	0.608	300	0.644
40	0.873	130	0.917	220	0.613	310	0.627
50	0.917	140	0.873	230	0.627	320	0.613
60	0.952	150	0.824	240	0.644	330	0.608
70	0.979	160	0.772	250	0.660	340	0.616
80	0.995	170	0.721	260	0.672	350	0.639

#### Additional Azimuths

Degree	V <sub>A</sub>

**Site 2: Antenna Location Data**

Section	Question	Response
<b>Antenna Structure Registration</b>	Do you have an FCC Antenna Structure Registration (ASR) Number?	Yes
	ASR Number	1271385
<b>Coordinates (NAD83)</b>	Latitude	35° 10' 36.4" N+
	Longitude	082° 40' 53.5" W-
	Structure Type	TOWER-A free standing or guyed struct
	Overall Structure Height	54.8 meters
	Support Structure Height	54.8 meters
	Ground Elevation (AMSL)	1146.9 meters
<b>Antenna Data</b>	Height of Radiation Center Above Ground Level	45.7 meters
	Height of Radiation Center Above Average Terrain	429.2 meters
	Height of Radiation Center Above Mean Sea Level	1192.6 meters
	Effective Radiated Power	0.90 kW

**Site 2: Antenna Technical Data**

Section	Question	Response
Antenna Type	Antenna Type	Non-Directional
	Do you have an Antenna ID?	
	Antenna ID	
Antenna Manufacturer and Model	Manufacturer:	ERI
	Model	AL8O-27-E
	Electrical Beam Tilt	1.75
	Mechanical Beam Tilt	Not Applicable
	toward azimuth	
	Polarization	Circular
DTV and DTS: Elevation Pattern	Does the proposed antenna propose elevation radiation patterns that vary with azimuth for reasons other than the use of mechanical beam tilt?	No
	Uploaded file for elevation antenna (or radiation) pattern data	

**Site 4: Antenna Location Data**

Section	Question	Response
<b>Antenna Structure Registration</b>	Do you have an FCC Antenna Structure Registration (ASR) Number?	No
	ASR Number	
<b>Coordinates (NAD83)</b>	Latitude	36° 02' 00.4" N+
	Longitude	082° 12' 08.5" W-
	Structure Type	TOWER-A free standing or guyed struct
	Overall Structure Height	35 meters
	Support Structure Height	35 meters
	Ground Elevation (AMSL)	1243 meters
<b>Antenna Data</b>	Height of Radiation Center Above Ground Level	33 meters
	Height of Radiation Center Above Average Terrain	320.7 meters
	Height of Radiation Center Above Mean Sea Level	1276 meters
	Effective Radiated Power	0.94 kW

**Site 4: Antenna Technical Data**

Section	Question	Response
Antenna Type	Antenna Type	Non-Directional
	Do you have an Antenna ID?	
	Antenna ID	1002716
Antenna Manufacturer and Model	Manufacturer:	ERI
	Model	AL8O-27-E
	Electrical Beam Tilt	1.75
	Mechanical Beam Tilt	Not Applicable
	toward azimuth	
	Polarization	Circular
DTV and DTS: Elevation Pattern	Does the proposed antenna propose elevation radiation patterns that vary with azimuth for reasons other than the use of mechanical beam tilt?	No
	Uploaded file for elevation antenna (or radiation) pattern data	

**Site 5: Antenna Location Data**

Section	Question	Response
<b>Antenna Structure Registration</b>	Do you have an FCC Antenna Structure Registration (ASR) Number?	Yes
	ASR Number	1299624
<b>Coordinates (NAD83)</b>	Latitude	35° 07' 56.7" N+
	Longitude	082° 59' 00.6" W-
	Structure Type	LTOWER-Lattice Tower
	Overall Structure Height	54.8 meters
	Support Structure Height	54.8 meters
	Ground Elevation (AMSL)	1453.8 meters
<b>Antenna Data</b>	Height of Radiation Center Above Ground Level	51.8 meters
	Height of Radiation Center Above Average Terrain	570.2 meters
	Height of Radiation Center Above Mean Sea Level	1505.6 meters
	Effective Radiated Power	0.88 kW

**Site 5: Antenna Technical Data**

Section	Question	Response
Antenna Type	Antenna Type	Non-Directional
	Do you have an Antenna ID?	
	Antenna ID	1002716
Antenna Manufacturer and Model	Manufacturer:	ERI
	Model	AL8O-27-E
	Electrical Beam Tilt	1.75
	Mechanical Beam Tilt	Not Applicable
	toward azimuth	
	Polarization	Circular
DTV and DTS: Elevation Pattern	Does the proposed antenna propose elevation radiation patterns that vary with azimuth for reasons other than the use of mechanical beam tilt?	No
	Uploaded file for elevation antenna (or radiation) pattern data	

**Site 6: Antenna Location Data**

Section	Question	Response
<b>Antenna Structure Registration</b>	Do you have an FCC Antenna Structure Registration (ASR) Number?	No
	ASR Number	
<b>Coordinates (NAD83)</b>	Latitude	35° 24' 47.0" N+
	Longitude	083° 30' 02.0" W-
	Structure Type	TOWER-A free standing or guyed struct
	Overall Structure Height	35 meters
	Support Structure Height	31 meters
	Ground Elevation (AMSL)	1007 meters
<b>Antenna Data</b>	Height of Radiation Center Above Ground Level	33 meters
	Height of Radiation Center Above Average Terrain	279.5 meters
	Height of Radiation Center Above Mean Sea Level	1040 meters
	Effective Radiated Power	0.94 kW

**Site 6: Antenna Technical Data**

Section	Question	Response
Antenna Type	Antenna Type	Non-Directional
	Do you have an Antenna ID?	
	Antenna ID	
Antenna Manufacturer and Model	Manufacturer:	ERI
	Model	AL8O-27-E
	Electrical Beam Tilt	1.75
	Mechanical Beam Tilt	Not Applicable
	toward azimuth	
	Polarization	Circular
DTV and DTS: Elevation Pattern	Does the proposed antenna propose elevation radiation patterns that vary with azimuth for reasons other than the use of mechanical beam tilt?	No
	Uploaded file for elevation antenna (or radiation) pattern data	

**Site 7: Antenna Location Data**

Section	Question	Response
<b>Antenna Structure Registration</b>	Do you have an FCC Antenna Structure Registration (ASR) Number?	No
	ASR Number	
<b>Coordinates (NAD83)</b>	Latitude	35° 18' 12.4" N+
	Longitude	083° 10' 39.5" W-
	Structure Type	TOWER-A free standing or guyed struct
	Overall Structure Height	35.4 meters
	Support Structure Height	35.4 meters
	Ground Elevation (AMSL)	777 meters
<b>Antenna Data</b>	Height of Radiation Center Above Ground Level	33 meters
	Height of Radiation Center Above Average Terrain	-146.0 meters
	Height of Radiation Center Above Mean Sea Level	810 meters
	Effective Radiated Power	0.94 kW

**Site 7: Antenna Technical Data**

Section	Question	Response
Antenna Type	Antenna Type	Non-Directional
	Do you have an Antenna ID?	
	Antenna ID	1002716
Antenna Manufacturer and Model	Manufacturer:	ERI
	Model	AL8O-27-E
	Electrical Beam Tilt	1.75
	Mechanical Beam Tilt	Not Applicable
	toward azimuth	
	Polarization	Circular
DTV and DTS: Elevation Pattern	Does the proposed antenna propose elevation radiation patterns that vary with azimuth for reasons other than the use of mechanical beam tilt?	No
	Uploaded file for elevation antenna (or radiation) pattern data	

<b>Construction Permit Certifications</b>	<b>Section</b>	<b>Question</b>	<b>Response</b>
	<b>Post-Incentive Auction Expedited Processing</b>	<p>It will operate on the DTV channel for this station as established in the post-incentive auction channel reassignment public notice.</p> <p>It will operate post-incentive auction facilities that do not expand the noise-limited service contour in any direction beyond that established by the post-incentive auction channel reassignment public notice.</p> <p>It will operate post-incentive auction facilities that match or reduce by no more than five percent with respect to predicted population from those defined in the post-incentive auction channel reassignment public notice.</p>	Yes No Yes
	<b>Environmental Effect</b>	Would a Commission grant of Authorization for this location be an action which may have a significant environmental effect? (See 47 C.F.R. Section 1.1306)	No
	<b>Broadcast Facility</b>	The proposed facility complies with all of the following applicable rule sections. 47 C.F.R. Sections 74.709, 74.793 (e), 74.793(f), 74.793(g), 74.793(h)	Yes
	<b>Interference Protection Provisions</b>	The proposed TV station satisfies the interference protection provisions of 47 C.F.R. Section 73.626.	Yes
	<b>DTS Facility Requirements</b>	<p>The combined coverage from all of the DTS transmitters in the proposed DTS facility covers all of the station's authorized service area, as required in 47 C.F.R. Section 73.626(f)(1).</p> <p>Each DTS transmitter's coverage is contained within either the TV station's Table of Distances area (47 C.F.R. Section 73.626 (c)) or its authorized service area, except where such coverage is of a minimal amount and necessary to meet the requirements of 47 C.F.R. Section 73.626(f)(1).</p>	Yes Yes, coverage entirely contained within station's authorized service area
		Each DTS transmitter's coverage is contiguous with at least one other DTS transmitter's coverage, as required in 47 C.F.R. Section 73.626(e)(3).	Yes
		The coverage from one or more DTS transmitter(s) in the DTS facility provide(s) principal community coverage, as required in 47 C.F.R. Section 73.626(e)(4).	Yes, one transmitter provides principal community coverage
		<p>The combined field strength of all of the DTS transmitters in the proposed DTS facility do not cause interference to another station in excess of the criteria specified in 47 C.F.R. Section 73.616, as required in 47 C.F.R. Section 73.626 (e)(5).</p> <p>Note: The combined field strength level shall be determined by a "root-sum-square" calculation, where the combined field strength level at a given location is equal to the square root of the sum of the squared field strengths from each transmitter in the DTS network at that location.</p>	Yes

Each DTS transmitter in the proposed DTS facility is located within either the TV station's Table of Distances area or its authorized service area.	Yes
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