

TECHNICAL EXHIBIT  
APPLICATION FOR CONSTRUCTION PERMIT  
CLEAR CHANNEL BROADCASTING LICENSES, INC.  
RADIO STATION WTKT  
HARRISBURG, PENNSYLVANIA

January 8, 2004

1460 KHZ 2.4 KW-D; 4.2 W-N U DA-N

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Technical Narrative

The technical exhibit of which this narrative is part has been prepared on behalf of Clear Channel Broadcasting Licenses, Inc., licensee of AM broadcast station WTKT at Harrisburg, Pennsylvania. WTKT is licensed as a Class B station for operation fulltime on 1460 kilohertz with a power of 5.0 kilowatts, operating daytime with a non-directional antenna and nighttime with a directional antenna. By means of this present application, the licensee proposes to construct a new transmitter site to replace the licensed site from which the station was evicted. WTKT will continue to employ a nondirectional antenna during daytime hours and a directional antenna at night at the new site, but it will be necessary to reduce the daytime power to 2.4 kilowatts and the nighttime power to 4.2 kilowatts due to allocation constraints.

The proposal is classified as a minor change according to 47 CFR 73.3571(a)(2). As a Class B station operating on one of the channels listed in 73.26(a), the proposal satisfies 47 CFR 73.21(a)(2) which permits operation with a nominal power of not less than 0.25 kilowatt nor more than 50 kilowatts at any time. The

proposal is acceptable for filing under the criteria set forth in 47 CFR 73.37.

The proposed facility will not have a significant environmental impact with regard to potential radio frequency electromagnetic field exposure to humans as defined by 47 CFR 1.1307(b). The Federal Aviation Administration has been notified of the proposal, as new tower construction is proposed.

#### Directional Antenna System

Three new towers will be employed for the proposed nighttime directional antenna pattern while the daytime nondirectional operation will use one of the three towers. The towers that are not used for nondirectional operation will be detuned. As shown on Figure 1, the radiating elements will be 57.9-meter (190-foot) towers with overall heights of 59.4 meters (195 feet) above ground level. Figure 2 shows a plat of the transmitter site. A summary of specifications for the nighttime directional antenna array is included herein as Figure 3.

The nighttime directional antenna pattern has been calculated in accordance with 47 CFR 73.150 assuming a one-ohm lumped loss resistance at the current loop of each tower in the array. The nighttime standard radiation pattern is shown herein as Figure 4 and is tabulated in Figure 5.

#### Waiver of Section 73.24(g)

The provisions of 47 CFR 73.24(g) require that the population within the 1,000 mV/m contour not exceed 1

percent of the population within the 25 mV/m groundwave contour. The proposed 1,000 mV/m nighttime contour encompasses 775 persons, or 1.1 percent of the 71,172 persons in the proposed 25 mV/m contour. As this exceeds the standard of 73.24(g), a waiver is respectfully requested.

The requirements of 73.24(g) date from a time before the massive shift of urban populations to suburban areas, when cities were generally well defined population centers surrounded by rural areas where radio stations were encouraged to construct their transmitter sites. Such is generally not the case today, as the areas surrounding large and medium size towns where transmitter sites must be located to provide satisfactory coverage are often densely populated.

In a number of past requests for waiver of 73.24(g), it has been noted that the vast majority of receivers suffer no degradation in reception with field strengths significantly higher than 1,000 mV/m. In fact, a field strength of 7,000 mV/m has been shown to be necessary to cause blanketing interference of any consequence. The population within the predicted daytime 7,000 mV/m contour is 0 persons. Based on the history of previous waiver requests that have been granted, the blanketing interference potential for WTKT is minimal. The applicant recognizes the responsibility to correct blanketing problems, if any occur.

The population within the proposed daytime 1000 mV/m contour is 261 persons. As this is less than 300 persons, the requirements of 73.24(g) are met in the daytime case.

#### Daytime Coverage

The proposed WTKT daytime field strength contours are depicted on Figure 6 and the existing daytime field strength contours are shown on Figure 7. As indicated on Figure 6, the proposed daytime 5 mV/m contour completely encompasses the city limits of Harrisburg. The Harrisburg city limits depicted were obtained from a map contained in the TIGER 2000 U.S. census files.

#### Daytime Allocation Study

A daytime allocation study was made utilizing FCC Figure M-3 as shown on sheet 1 of Figure 8. Sheet 2 of Figure 8 shows, in detail, that the only station with which the proposed WTKT nondirectional antenna pattern will have prohibited overlap is co-channel station WEMR in Tunkhannock, Pennsylvania. With the reduction in daytime power necessary to avoid an increase in overlap of the WTKT 0.5 mV/M contour with the WEMR 0.025 mV/M contour, there will be a reduction in the area over which the WTKT 0.025 mV/M contour overlaps the WEMR 0.5 mV/M contour. The daytime field strength contours were calculated in accordance with 47 CFR 73.183. Figure 9 is a tabulation of the data employed in the calculation of daytime contours. Based on this analysis, the proposed WTKT facility will comply with all relevant allocation criteria.

#### City-of-License Coverage

The proposed WTKT daytime and nighttime field strength contours are depicted on Figures 7 and 10, respectively. The proposed daytime 5 mV/m contour and the proposed nighttime 9.6 mV/m nighttime interference-free

contour both completely encompass the city limits of Harrisburg.

#### Nighttime Allocation Study

The proposed WTKT facility will afford nighttime protection to all stations and international allotments operating on 1450 kHz, 1460 kHz, and 1470 kHz. Figure 12 contains pertinent calculation data to support a conclusion that this proposal comports with all nighttime interference protection requirements.

#### Waiver of Section 73.182(q)

As is the case with many fulltime stations that have occupied their channels for a number of years, the licensed WTKT nighttime facility produces skywave interference limits that enter into the 50-percent exclusion RSS values of several domestic stations. Six such instances are denoted on sheets 4 and 5 of Figure 12, the nighttime allocation study. Footnote 1 of Section 73.182(q) of the FCC's Rules requires that stations making facility changes reduce the radiation toward the other stations whose 50-percent exclusion RSS values they enter by either 10-percent or to a value that eliminates their limit when 50-percent exclusion is applied, if higher. The purpose is to provide some degree of "interference reduction" whenever such a station chooses to make a change in its facilities. It is requested that the requirement be waived in this instance, as the proposed relocation is not by the WTKT licensee's choice.

WTKT was forced to cease operating with its licensed nighttime directional antenna approximately three



years ago because of the loss of the right to use the land at the transmitter site due to circumstances beyond the licensee's control. When the station was evicted, operation was begun with reduced power under a special temporary authorization and a search for a suitable new transmitter site was initiated. The search was complicated by the need to provide interference-free service to the city of license using a nighttime directional antenna designed to provide the requisite protection to other stations and local land-use requirements in the suitable areas. After proposing another site for which a local building permit could not be obtained, the licensee identified the site proposed herein and took steps to obtain local approval for construction of the three towers before authorizing the preparation of this application. This site, which is 5.7 kilometers from the licensed site, represents what is believed to be the best option for preserving the licensed nighttime coverage of WTKT to the fullest extent possible.

It is necessary for WTKT to reduce nighttime power from 5 kilowatts to 4.2 kilowatts to provide at least the same degree of interference protection to other stations with the proposed directional antenna pattern as is afforded by the licensed nighttime directional antenna pattern. An effort was made to design the pattern to reduce interference wherever it was possible to do so consistent with maintaining near-optimum local coverage from the proposed site. The proposed nighttime directional antenna will reduce the nighttime RSS contribution limits below those of the licensed pattern at the following stations:

50% RSS			
Station	Existing Limit	Proposed Limit	Percent Change
WBET	9.22	9.15	-0.8
WEMD	44.07	43.40	-1.5
WIFI	39.51	39.10	-1.0
WEMR	7.96	7.90	-0.8
WKDV	13.79	13.40	-2.8
WKAP	1.59	1.54	-3.2

25% RSS			
Station	Existing Limit	Proposed Limit	Percent Change
WDDY	2.60	1.12	-132
WHIC	3.56	2.89	-23.2
WMBA	4.20	2.43	-72.8

Although it was possible to provide significant interference reduction in many cases, it was not practicable to provide a 10-percent radiation reduction toward all of the stations that receive 50-percent exclusion RSS contributions from WTKT without significantly compromising local coverage. As the six stations which receive 50-percent exclusion RSS contributions from the licensed WTKT directional antenna are located at various diverse azimuths, there cannot be a simultaneous 10-percent reduction in radiation toward them all without a significant further reduction in operating power or construction of a much more complicated array. Since a larger array will not fit on the available property at the proposed site, a power reduction to significantly below the proposed 4.2 kilowatt level would be required for an across-the-board 10-percent radiation reduction toward all of the pertinent stations.

As the licensed WTKT transmitter site has been lost to eviction, the proposed site is the closest one to

the licensed site for which local approval to construct the towers could be obtained, every effort was made to replicate the licensed nighttime service area to the fullest extent possible while materially reducing the interference levels at several other stations, and a greater power reduction than the one proposed herein would be required to further reduce radiation toward the pertinent stations, a waiver of the "10-percent reduction" requirement of Section 73.182(q) of the Rules is respectfully requested. Such a waiver would be consistent with others that have been granted by the FCC under circumstances where stations had to be moved due to circumstances beyond their licensees' control.

#### Site Coordinates

The proposed site coordinates were determined by a registered surveyor and verified with a handheld GPS. The NAD 27 coordinates are:

40-18-32 North  
76-56-13 West

#### Site Location and Photographs

Figure 13 shows a topographical map with the exact location of the proposed facility. Figure 14 shows photographs taken in 8 directions every 45 degrees beginning at in the northerly direction.

#### Environmental Considerations

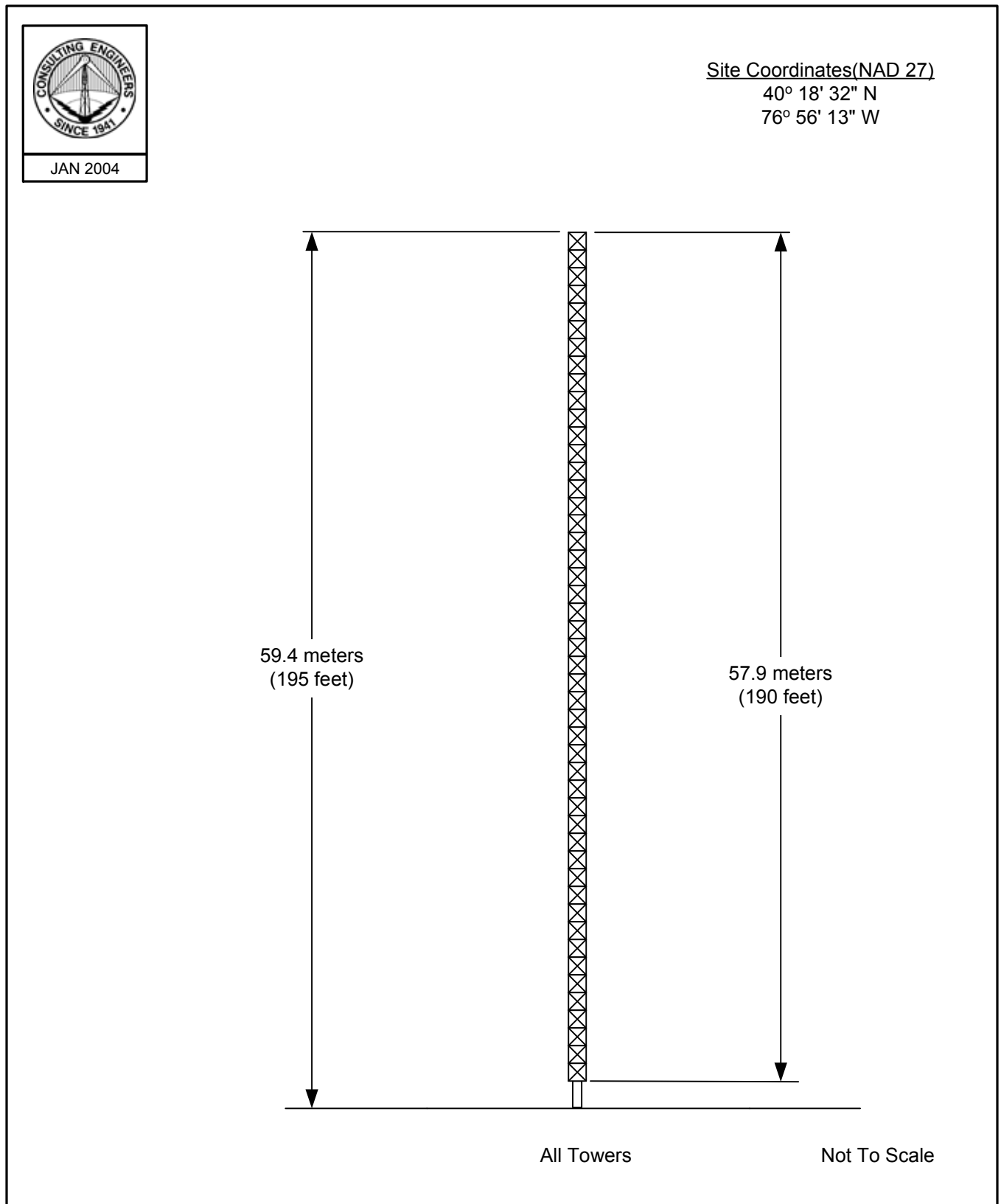
The proposed WTKT operation, both daytime and nighttime, was evaluated in terms of both the electric and

magnetic field components which will be present at the base of each tower. Using Figures 1 through 4 of Supplement A to OET Bulletin 65, the worst-case interpolated distance at which the electric and magnetic fields would fall below ANSI guidelines is 2 meters. The area surrounding the base of each tower will be appropriately restricted with a fence having a minimum radius of 2 meters (7 feet), unless data obtained after construction has been completed indicates otherwise. The fences should assure that persons on the property outside the fenced areas will not be exposed to radiofrequency field levels in excess of the standards specified in 47 CFR 1.1307(b) for human exposure to radiofrequency radiation.

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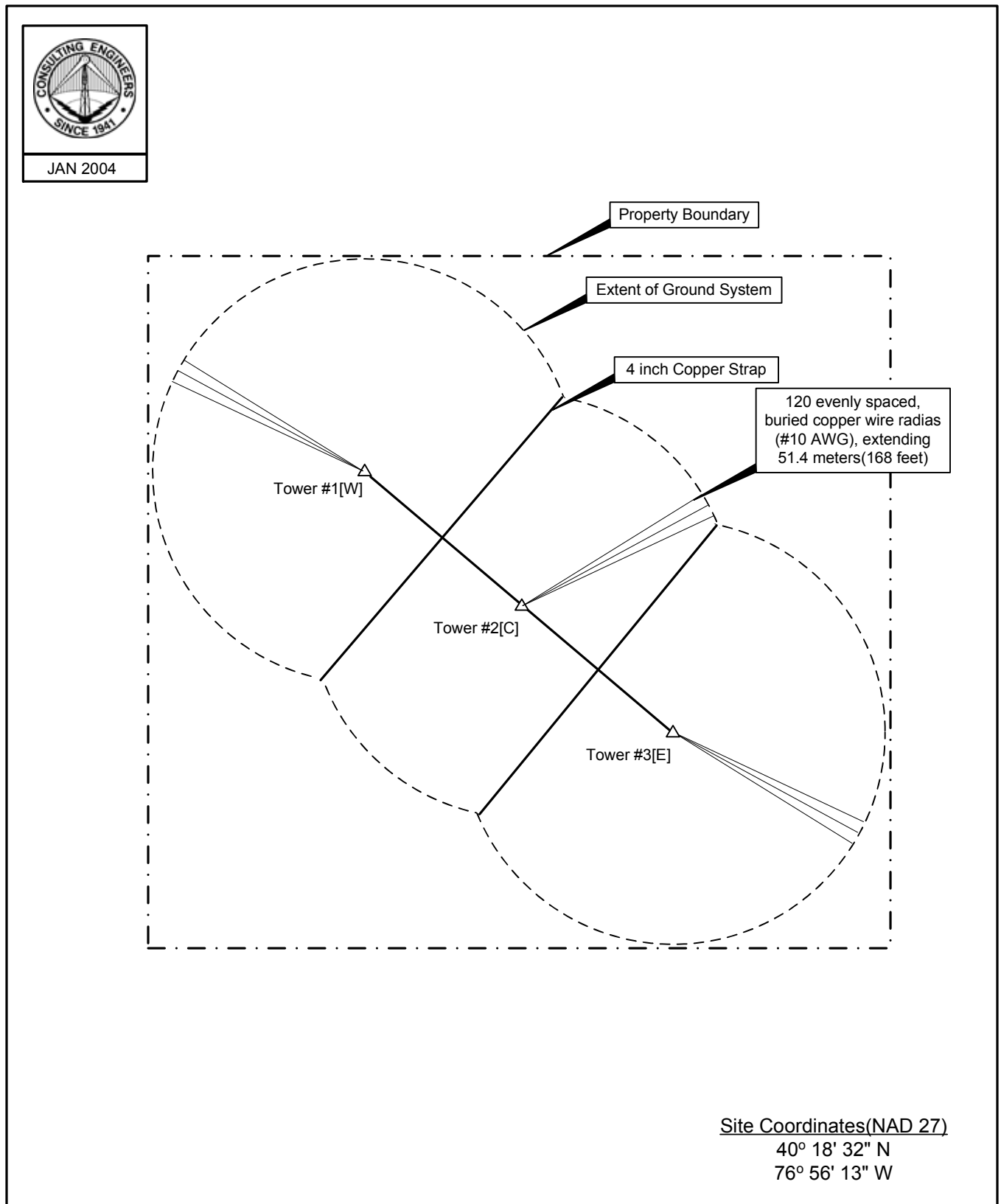
January 8, 2004



## SKETCH OF ANTENNA ELEMENTS

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## PLAT OF TRANSMITTER LOCATION

RADIO STATION WTKT  
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1460 KHz 2.4 KW-D, 4.2 KW-N U DA-N

Specification for Nighttime  
Directional Antenna System

Frequency: 1460 kHz  
Hours of Operation: Unlimited  
Power: 4.2 kW  
Number of Towers: 3  
Type of Tower: Guyed, Uniform Cross-section,  
base-insulated  
All Towers - height above  
base insulator 57.9 m (190 ft)  
All Towers - overall height 59.4 m (195 ft)

Tower Arrangement:

Tower No.	Spacing (deg.) / (m)	Orientation (deg. True)
1 (W)	0.0/0.0	0.0
2 (C)	88.9/50.7	130.2
3 (E)	175.8/100.3	130.2

Element Field Parameters:

Nighttime:

Tower No.	Field Ratio	Phase (degrees)
1 (W)	1.000	0.0
2 (C)	1.618	-152.5
3 (E)	0.986	+55.5

Ground System:

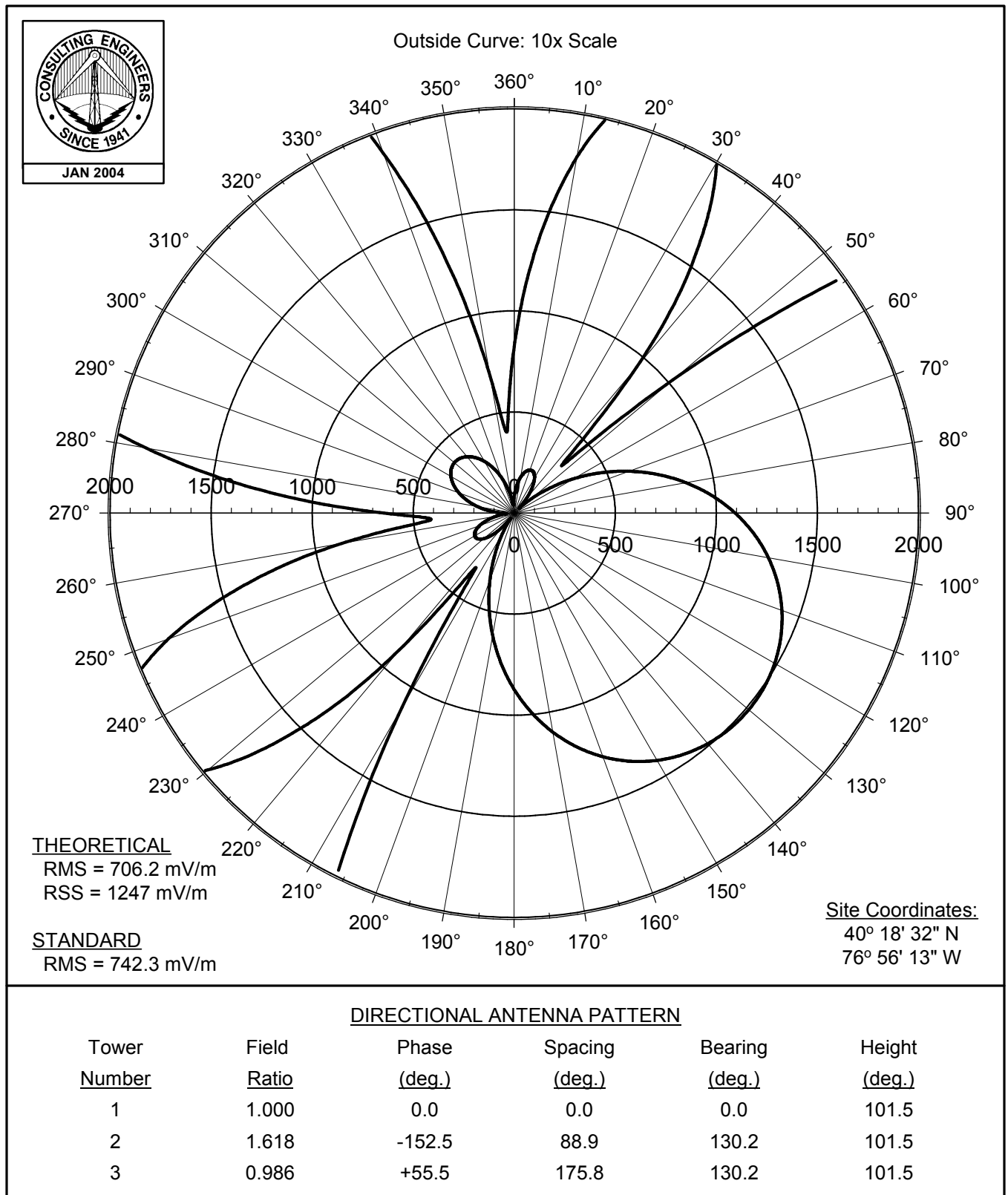
Installed about the base of each tower are 120 evenly spaced, buried copper wire radials (#10 AWG), extending 51.4 meters (168 ft) from all towers except where shortened and bonded to transverse copper strap between towers. In addition, 4 inch copper strap runs from the transmitter and down the line of towers and is bonded to ground at the base of each tower.

Geographic Coordinates of  
Center of Antenna Array:

40° 18' 32" North Latitude  
76° 56' 13" West Longitude



Figure 4



## PROPOSED NIGHTTIME HORIZONTAL PLANE STANDARD RADIATION PATTERN

RADIO STATION WTKT  
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NIGHTTIME RADIATION PATTERN  
(Radiation Values at One Kilometer)

Tower <u>Number</u>	Field <u>Ratio</u>	Phase <u>(deg.)</u>	Spacing <u>(deg.)</u>	Bearing <u>(deg.)</u>	Height <u>(deg.)</u>
1	1.000	0.0	0.0	0.0	101.5
2	1.618	-152.5	88.9	130.2	101.5
3	0.986	+55.5	175.8	130.2	101.5

Input Power <u>(kW)</u>	Loop Loss <u>(ohms)</u>	Theo. RMS <u>(mV/m)</u>	Theo. RSS <u>(mV/m)</u>	Q Factor <u>(mV/m)</u>	Standard RMS <u>(mV/m)</u>
4.2	1.0	706.2	1247	31.2	742.3

Standard Radiation Pattern  
(at One Kilometer)

Azimuth Angle (deg)	Elevation Angle in Degrees						
	0 (mV/m)	5 (mV/m)	10 (mV/m)	15 (mV/m)	20 (mV/m)	25 (mV/m)	30 (mV/m)
0	82.3	83.8	87.9	94.3	102	110	117
5	134	135	137	140	142	144	145
10	179	179	178	177	175	172	166
15	211	210	207	203	197	189	179
20	226	225	221	215	206	195	182
25	223	222	217	210	200	188	173
30	200	199	194	187	178	166	152
35	157	156	152	146	139	130	119
40	94.2	93.6	91.8	89.0	85.2	80.5	75.1
45	33.0	32.9	32.4	31.7	30.9	30.1	29.2
50	102	101	96.9	90.4	81.9	71.9	61.1
55	215	212	204	191	175	155	134
60	339	335	323	304	278	249	216
65	470	464	448	422	388	347	302
70	603	596	576	543	499	448	391
75	735	727	702	662	610	548	479
80	863	853	824	778	717	645	565
85	983	972	939	887	819	737	647
90	1093	1080	1045	988	913	823	723
95	1191	1178	1140	1078	997	900	792
100	1277	1263	1223	1157	1071	968	852
105	1350	1335	1293	1225	1134	1026	905
110	1409	1394	1350	1280	1186	1073	948
115	1455	1440	1395	1322	1226	1111	981
120	1488	1472	1426	1353	1255	1137	1006
125	1507	1492	1446	1371	1273	1154	1020
130	1514	1499	1452	1378	1279	1159	1025
135	1508	1493	1447	1372	1273	1154	1021
140	1490	1474	1428	1355	1257	1139	1007
145	1458	1443	1398	1325	1229	1113	984
150	1413	1398	1354	1284	1190	1077	951
155	1355	1340	1298	1229	1139	1030	908
160	1283	1269	1229	1163	1076	973	857
165	1198	1185	1147	1085	1003	906	797
170	1101	1089	1053	996	920	829	729
175	992	981	948	896	827	744	653

Standard Radiation Pattern  
(at One Kilometer)

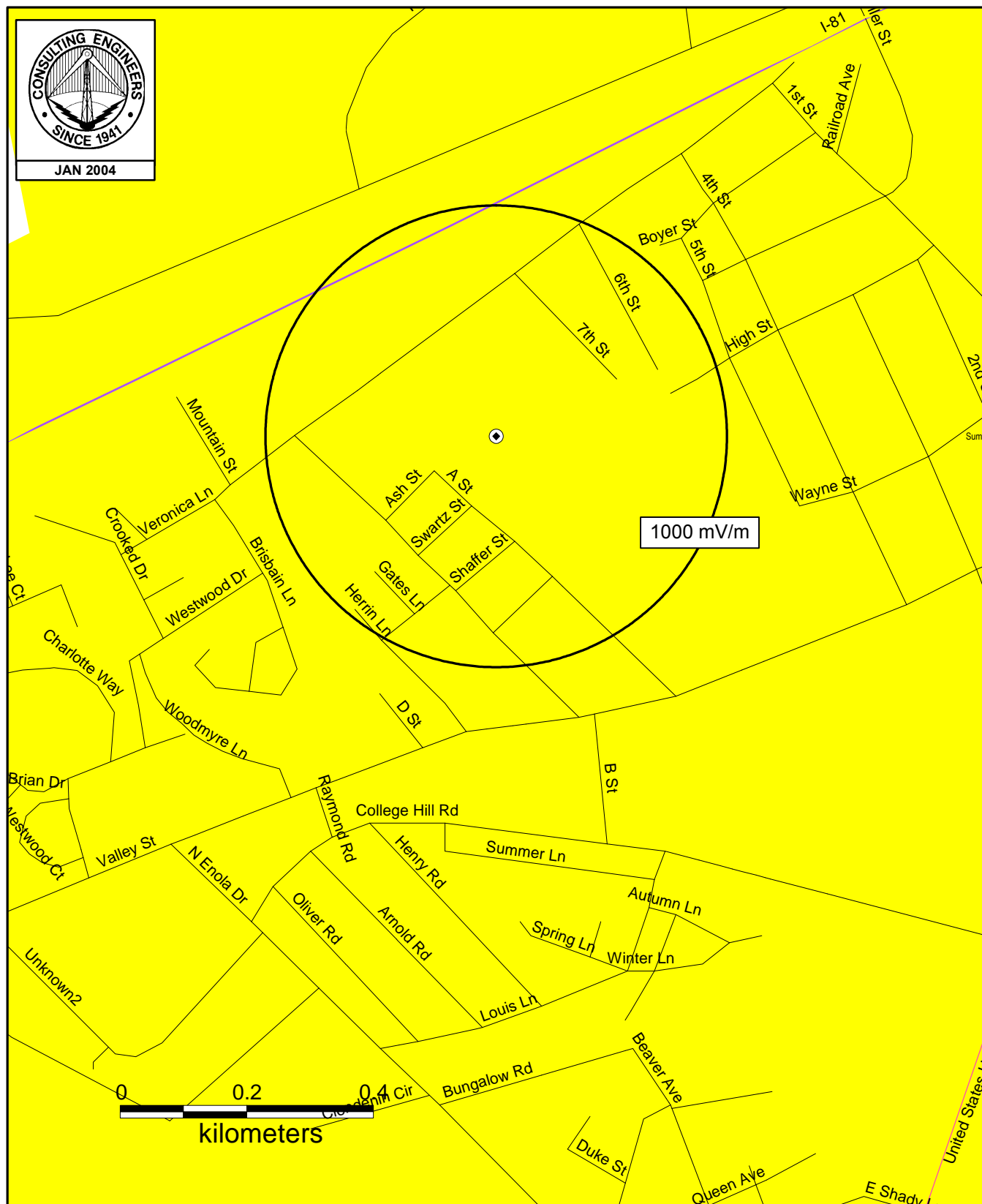
Azimuth Angle (deg)	Elevation Angle in Degrees						
	35 (mV/m)	40 (mV/m)	45 (mV/m)	50 (mV/m)	55 (mV/m)	60 (mV/m)	65 (mV/m)
0	122	123	121	114	103	89.5	73.0
5	143	138	130	119	105	89.1	71.5
10	159	149	136	121	105	87.2	69.0
15	167	153	137	120	102	83.6	65.4
20	167	151	133	115	96.3	78.1	60.7
25	157	140	123	105	87.6	70.7	54.8
30	138	122	107	90.9	75.7	61.2	47.6
35	108	96.3	84.2	72.3	60.7	49.7	39.3
40	69.2	62.9	56.4	49.7	43.1	36.5	30.1
45	28.4	27.6	26.7	25.6	24.2	22.5	20.3
50	50.0	39.4	29.7	21.8	16.0	12.9	11.9
55	112	90.1	69.5	50.9	34.9	22.0	12.9
60	182	148	116	86.9	61.3	39.9	23.3
65	256	210	166	125	89.8	59.9	36.0
70	332	273	217	165	119	80.6	49.5
75	408	336	268	205	149	101	63.2
80	482	398	318	244	178	122	76.7
85	552	457	366	281	206	142	89.7
90	618	512	411	316	232	160	102
95	678	563	452	349	257	178	113
100	731	608	489	378	278	193	124
105	776	647	521	403	298	207	133
110	814	679	547	424	314	218	140
115	844	704	568	441	326	227	146
120	865	723	584	453	335	234	151
125	878	734	593	461	341	238	153
130	883	738	596	463	343	239	154
135	879	734	593	461	341	238	153
140	867	724	585	454	336	234	151
145	846	706	570	442	327	228	147
150	817	681	549	426	315	219	141
155	780	649	523	405	299	208	133
160	735	611	492	380	280	194	124
165	682	567	455	351	258	179	114
170	623	517	414	319	234	162	103
175	558	462	369	284	208	143	90.7

Standard Radiation Pattern  
(at One Kilometer)

Azimuth Angle (deg)	Elevation Angle in Degrees						
	0 (mV/m)	5 (mV/m)	10 (mV/m)	15 (mV/m)	20 (mV/m)	25 (mV/m)	30 (mV/m)
180	873	863	834	787	726	653	572
185	746	737	712	672	619	556	486
190	614	607	586	552	508	456	398
195	480	475	458	431	396	355	309
200	349	345	333	313	287	256	223
205	224	221	213	200	183	163	140
210	111	109	105	97.9	88.7	78.0	66.4
215	33.0	32.7	32.1	31.0	29.8	28.5	27.4
220	88.5	88.0	86.4	83.8	80.4	76.1	71.2
225	152	151	148	142	135	126	116
230	198	196	192	185	175	164	150
235	222	221	216	209	199	186	172
240	227	225	222	215	206	195	182
245	212	212	209	205	198	190	180
250	182	182	181	180	177	173	168
255	138	139	141	143	145	147	147
260	86.6	88.0	92.0	98.1	105	113	119
265	41.9	42.7	45.8	52.5	62.7	75.2	88.0
270	64.5	61.4	53.0	42.2	35.6	41.1	55.9
275	124	119	106	86	62.0	39.6	32.8
280	185	179	163	138	106	72.3	41.3
285	241	235	216	187	150	109	67.8
290	291	284	263	231	189	143	94.7
295	332	324	302	266	221	170	118
300	362	354	330	293	245	191	135
305	380	372	348	309	260	204	146
310	387	378	354	315	265	209	150
315	381	373	348	310	261	205	147
320	364	355	332	295	247	193	136
325	334	327	304	269	224	172	119
330	295	288	267	234	192	145	96.7
335	246	239	220	191	154	112	70.0
340	189	184	167	142	110	75.2	43.1
345	129	124	111	90.1	65.3	41.6	32.1
350	68.8	65.5	56.6	44.6	35.7	39.2	53.4
355	40.4	40.9	43.3	49.4	59.5	72.2	85.4

Standard Radiation Pattern  
(at One Kilometer)

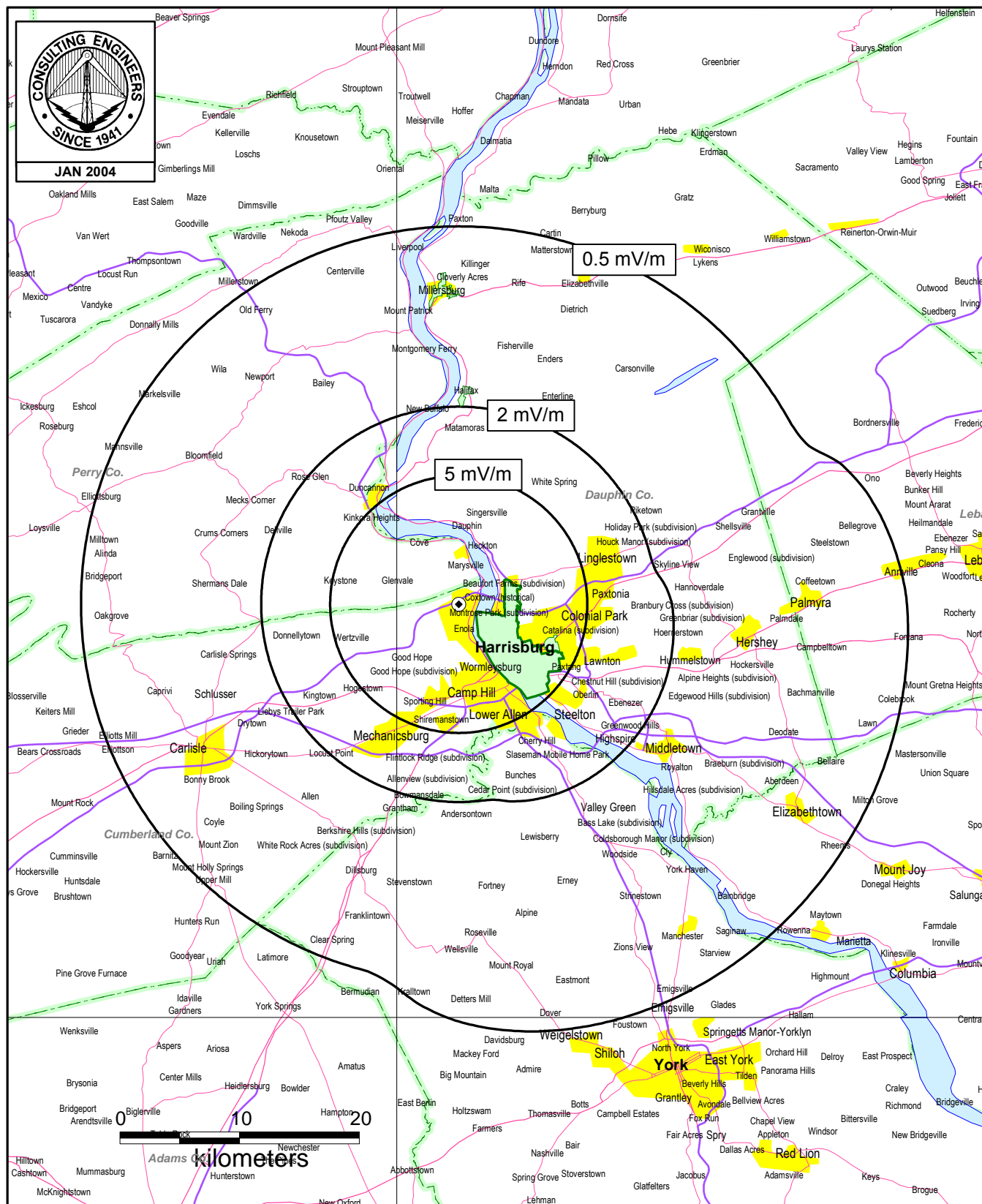
Azimuth Angle (deg)	Elevation Angle in Degrees						
	35 (mV/m)	40 (mV/m)	45 (mV/m)	50 (mV/m)	55 (mV/m)	60 (mV/m)	65 (mV/m)
180	487	403	322	247	180	124	77.7
185	414	341	272	208	151	103	64.3
190	338	278	221	168	122	82.2	50.6
195	262	215	170	128	92.1	61.5	37.1
200	188	153	120	89.9	63.5	41.5	24.2
205	117	94.6	73.1	53.6	36.8	23.3	13.6
210	54.4	42.9	32.4	23.5	16.8	12.9	11.5
215	26.4	25.5	24.8	23.9	22.8	21.4	19.5
220	65.8	60.0	54.0	47.8	41.6	35.4	29.3
225	105	93.8	82.2	70.6	59.4	48.7	38.6
230	136	121	105	90	74.6	60.3	47.0
235	156	139	122	104	86.7	70.0	54.3
240	167	150	132	114	95.7	77.6	60.3
245	167	153	137	120	102	83.2	65.1
250	160	149	136	121	105	87.0	68.7
255	144	139	131	119	105	89.0	71.3
260	124	125	122	115	104	89.5	72.9
265	98.9	106	109	107	100	88.8	73.7
270	72.4	86.3	95.5	98.7	95.7	87.1	73.9
275	47.0	65.7	80.6	89.0	90.3	84.8	73.5
280	30.2	46.6	65.9	79.2	84.6	82.1	72.8
285	34.4	31.9	52.4	69.8	78.9	79.3	71.9
290	51.2	26.4	41.1	61.4	73.7	76.6	70.9
295	68.1	30.6	32.8	54.5	69.4	74.3	70.1
300	81.6	37.5	27.7	49.4	66.0	72.5	69.3
305	90.1	42.8	25.4	46.2	63.9	71.4	68.9
310	93.2	44.8	24.8	45.1	63.2	71.0	68.7
315	90.6	43.1	25.3	46.0	63.8	71.3	68.9
320	82.4	38.0	27.4	49.0	65.8	72.4	69.3
325	69.4	31.1	32.2	54.0	69.0	74.2	70.0
330	52.6	26.5	40.3	60.8	73.4	76.4	70.9
335	35.5	31.1	51.4	69.1	78.5	79.1	71.8
340	29.6	45.2	64.8	78.4	84.1	81.9	72.7
345	45.2	64.1	79.4	88.2	89.9	84.6	73.4
350	70.3	84.7	94.3	97.9	95.3	87.0	73.9
355	96.8	105	108	107	100	88.7	73.8



## PROPOSED DAYTIME FIELD STRENGTH CONTOURS

RADIO STATION WTKT  
HARRISBURG, PENNSYLVANIA  
1460 KHZ 2.4 KW-D, 4.2 KW-N U DA-N

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

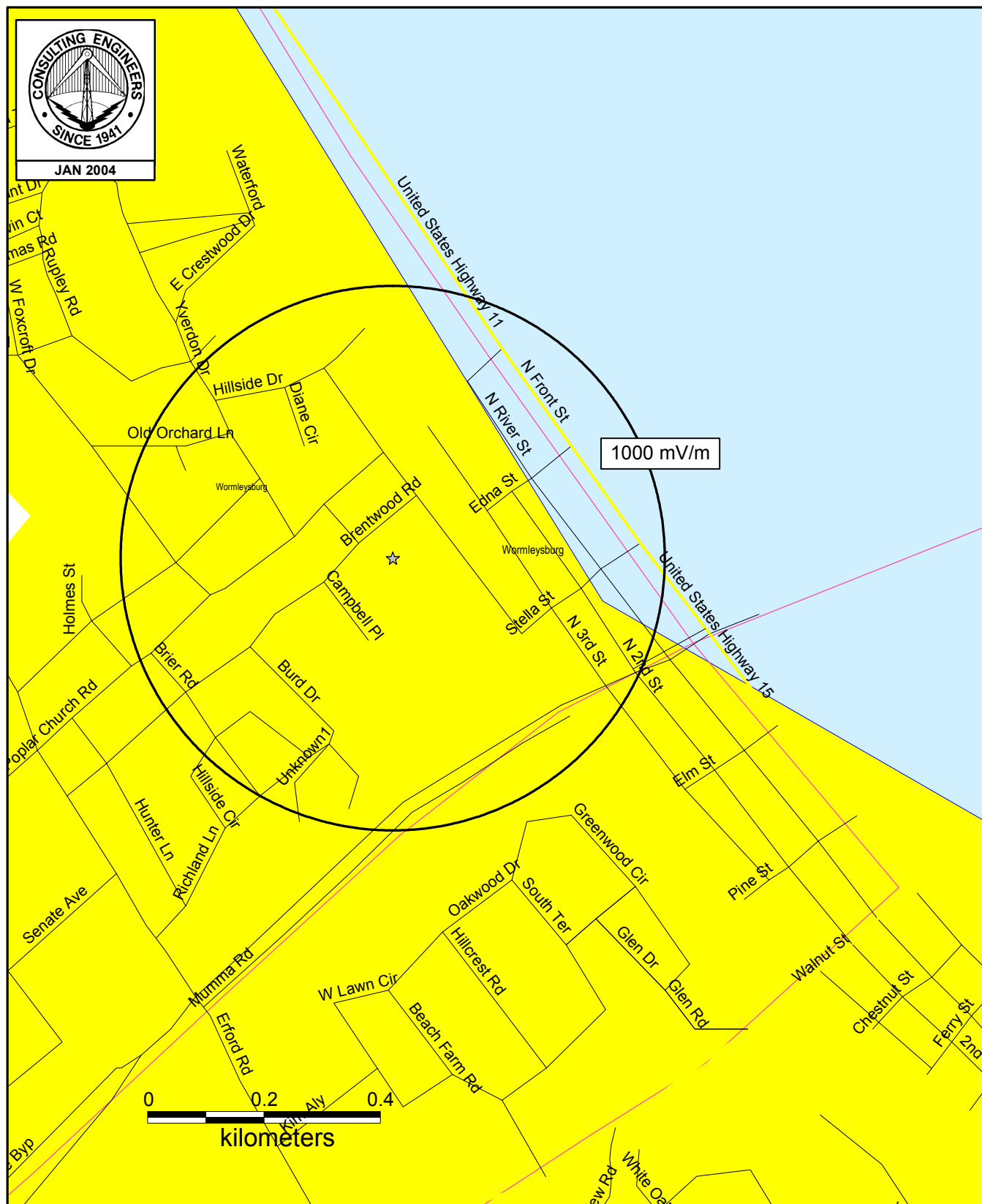


## PROPOSED DAYTIME FIELD STRENGTH CONTOURS

RADIO STATION WTKT  
HARRISBURG, PENNSYLVANIA  
1460 KHZ 2.4 KW-D, 4.2 KW-N U DA-N

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

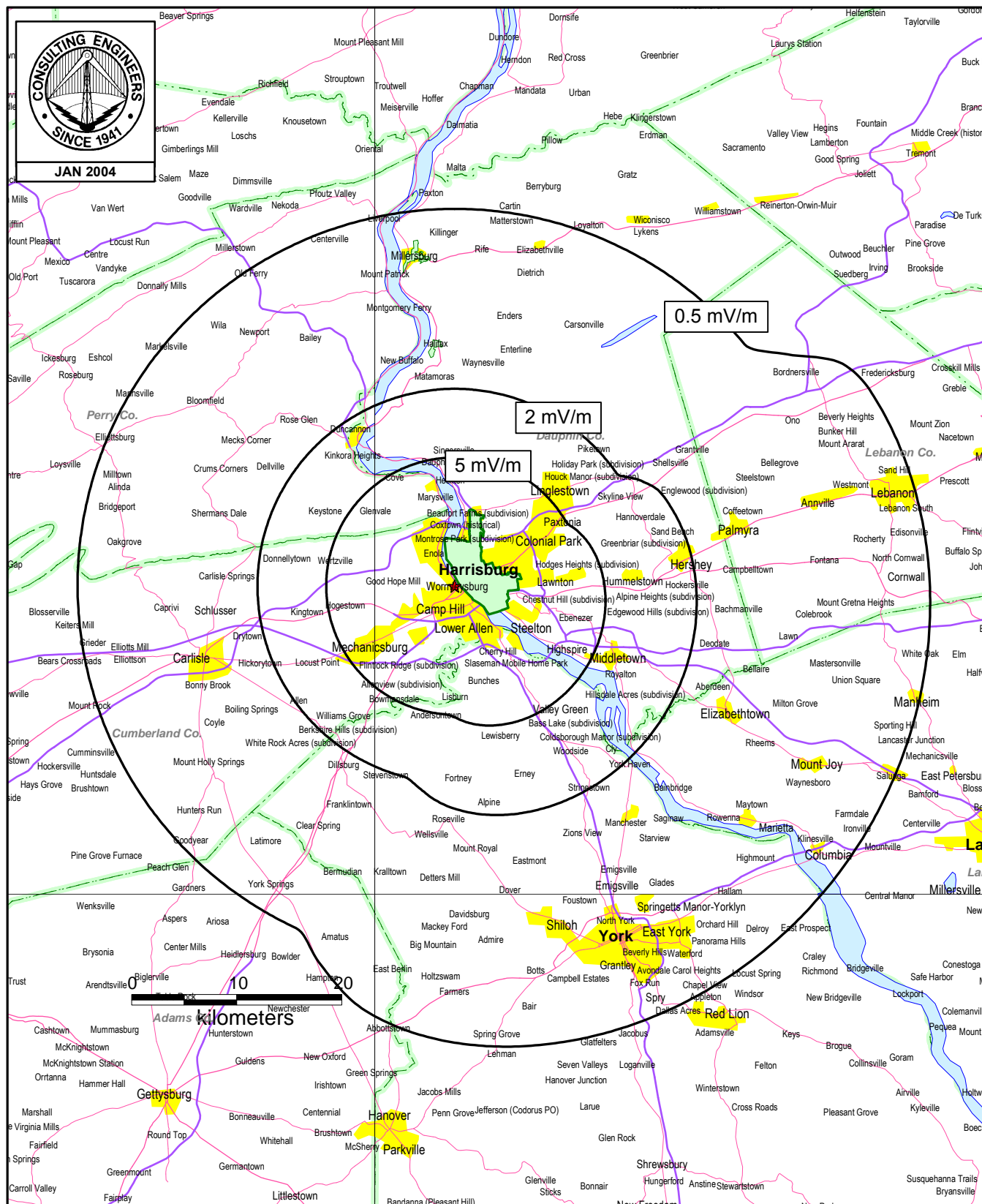




## EXISTING DAYTIME FIELD STRENGTH CONTOURS

RADIO STATION WWTKT  
HARRISBURG, PENNSYLVANIA  
1460 KHZ 2.4 KW-D, 4.2 KW-N U DA-N

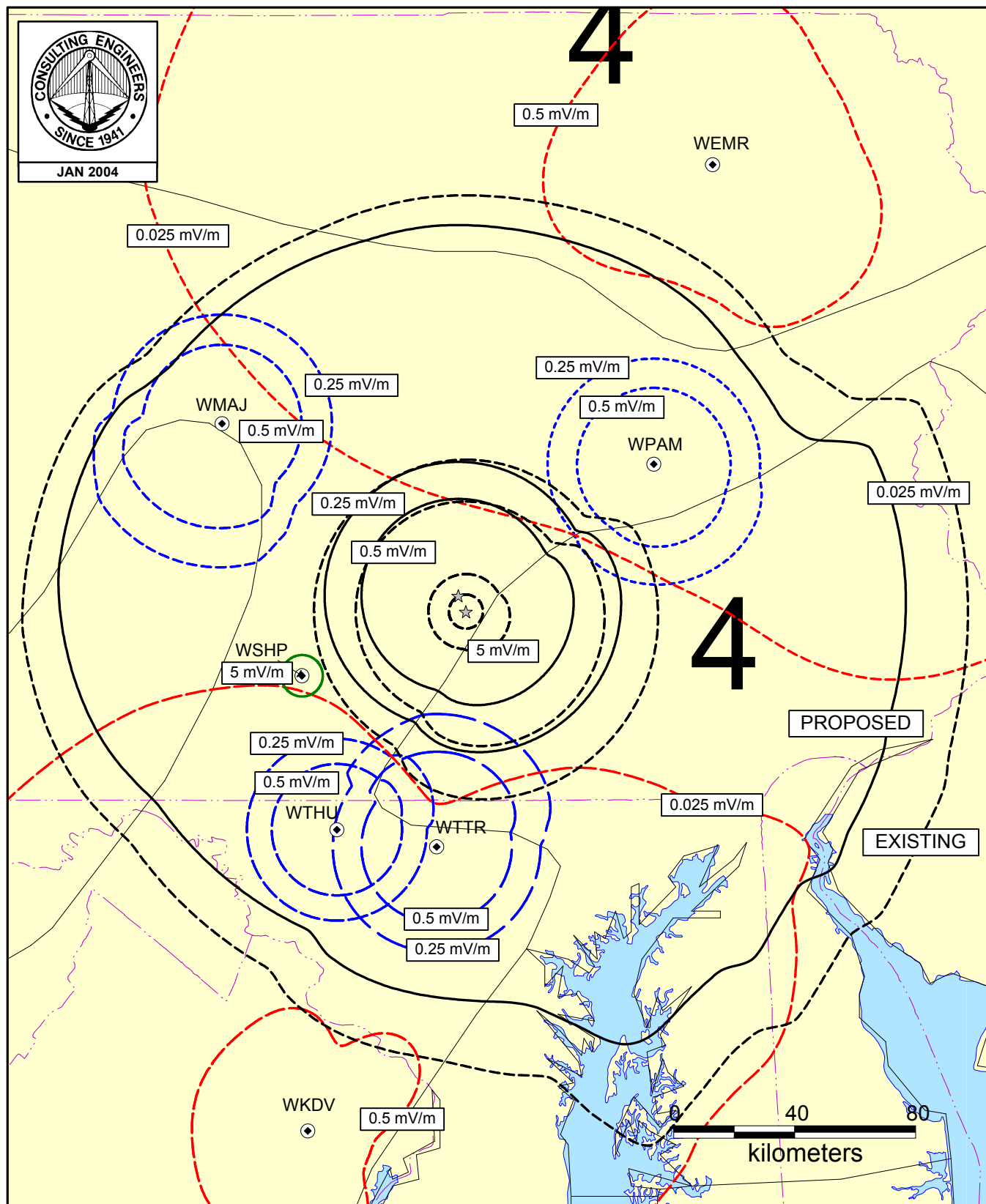
du Treil, Lundin & Rackley, Inc. Sarasota, Florida



## EXISTING DAYTIME FIELD STRENGTH CONTOURS

RADIO STATION WKTT  
HARRISBURG, PENNSYLVANIA  
1460 KHZ 2.4 KW-D, 4.2 KW-N U DA-N

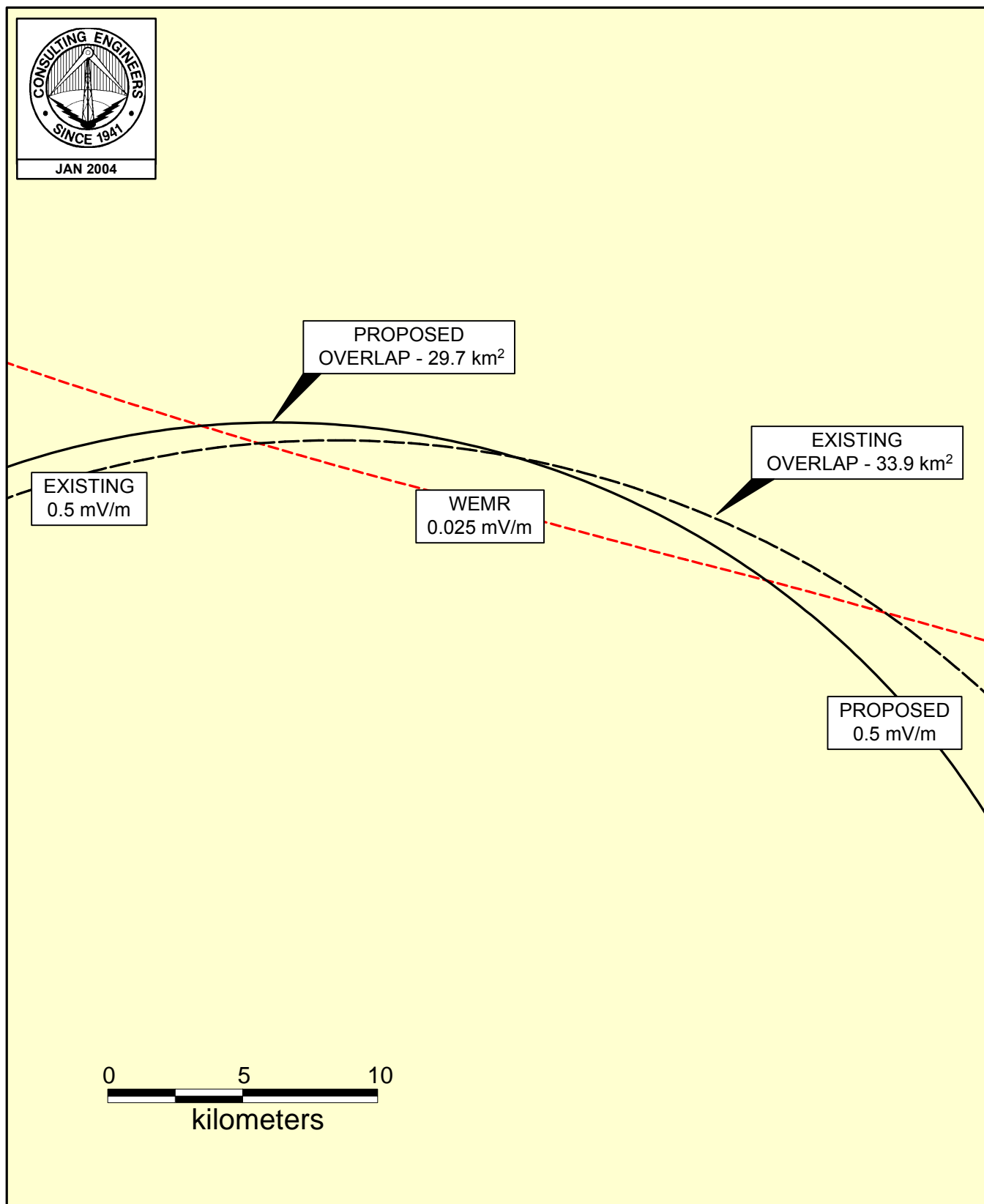
du Treil, Lundin & Rackley, Inc. Sarasota, Florida



## DAYTIME ALLOCATION STUDY

RADIO STATION WTKT  
HARRISBURG, PENNSYLVANIA  
1460 KHZ 2.4 KW-D, 4.2 KW-N U DA-N

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



## DAYTIME ALLOCATION STUDY

RADIO STATION WTKT  
HARRISBURG, PENNSYLVANIA  
1460 KHZ 2.4 KW-D, 4.2 KW-N U DA-N

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

TECHNICAL EXHIBIT  
APPLICATION FOR CONSTRUCTION PERMIT  
RADIO STATION WTKT  
HARRISBURG, PENNSYLVANIA

1460 KHZ 2.4 KW-D; 4.2 W-N U DA-N

Tabulation of Data Employed in  
Calculation of Groundwave Contours

Call: WTKT - Proposed  
Harrisburg, PA  
Coordinates: 40-18-32 North 76-56-13 West  
Frequency: 1460 kHz

FCC M3 conductivity employed along all azimuths

Call: WTKT - License  
Harrisburg, PA  
Coordinates: 40-15-42 North 76-54-40 West  
Frequency: 1460 kHz

FCC M3 conductivity employed along all azimuths

Call: WEMR - License  
Tunkhannock, PA  
Coordinates: 41-33-46 North 75-58-11 West  
Frequency: 1460 kHz

FCC M3 conductivity employed along all azimuths

Call: WKDV - License  
Manassas, VA  
Coordinates: 38-45-00 North 77-30-49 West  
Frequency: 1460 kHz

FCC M3 conductivity employed along all azimuths

Call: WPAM - License  
Pottsville, PA  
Coordinates: 40-41-27 North 76-11-39 West  
Frequency: 1450 kHz

FCC M3 conductivity employed along all azimuths

Call: WMAJ - License  
State College, PA  
Coordinates: 40-48-32 North 77-50-28 West  
Frequency: 1450 kHz

FCC M3 conductivity employed along all azimuths

Call: WTHU - License  
Thurmont, MD  
Coordinates: 39-37-37 North 77-24-11 West  
Frequency: 1450 kHz

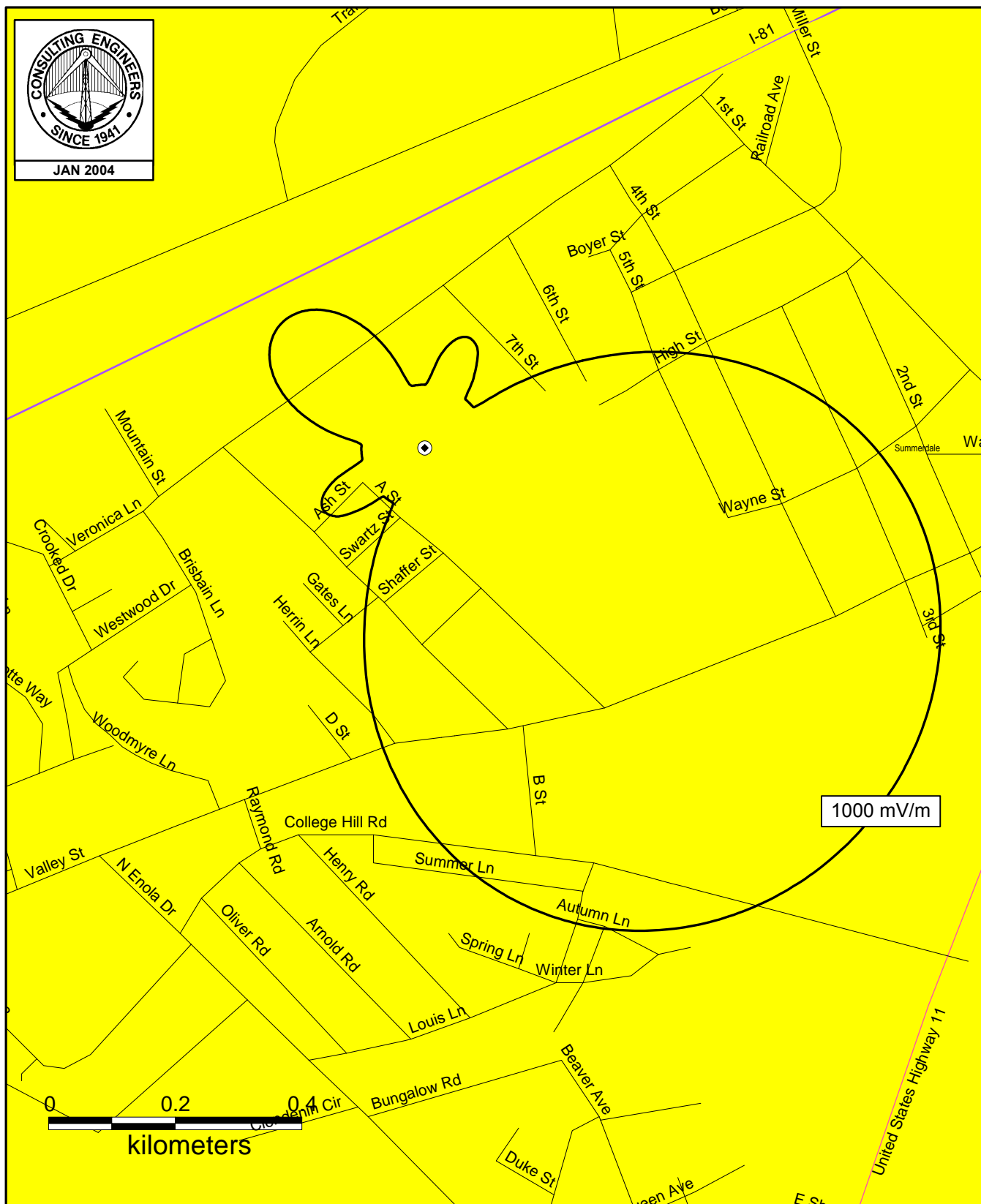
FCC M3 conductivity employed along all azimuths

Call: WTTR - License  
Westminster, MD  
Coordinates: 39-34-37 North 77-01-21 West  
Frequency: 1470 kHz

FCC M3 conductivity employed along all azimuths

Call: WSHP - License  
Shippensburg, PA  
Coordinates: 40-04-30 North 77-32-09 West  
Frequency: 1480 kHz

FCC M3 conductivity employed along all azimuths

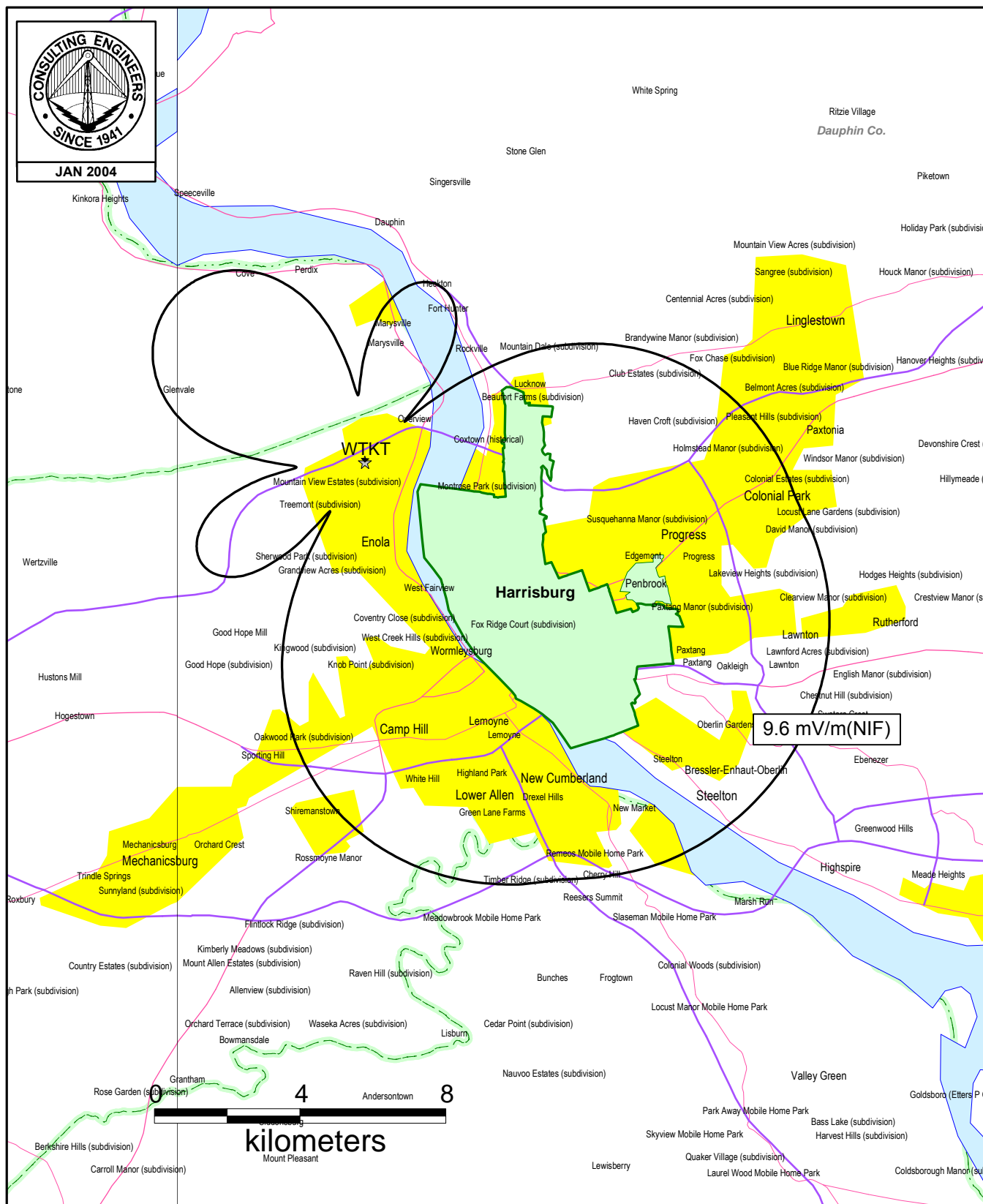


## PROPOSED NIGHTTIME FIELD STRENGTH CONTOURS

RADIO STATION WTKT  
HARRISBURG, PENNSYLVANIA  
1460 KHZ 2.4 KW-D, 4.2 KW-N U DA-N

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

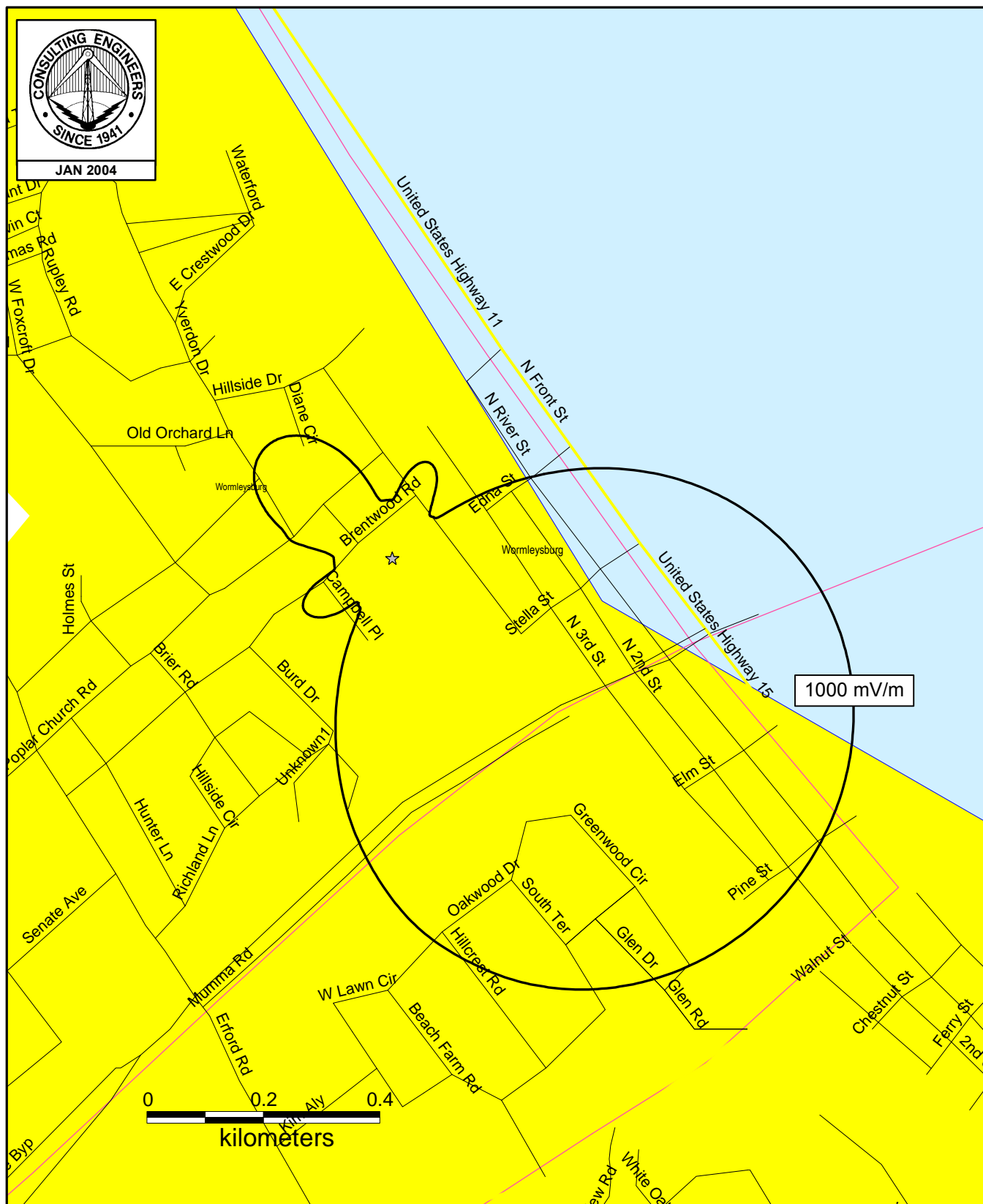




## PROPOSED NIGHTTIME FIELD STRENGTH CONTOURS

RADIO STATION WTKT  
HARRISBURG, PENNSYLVANIA  
1460 KHZ 2.4 KW-D, 4.2 KW-N U DA-N

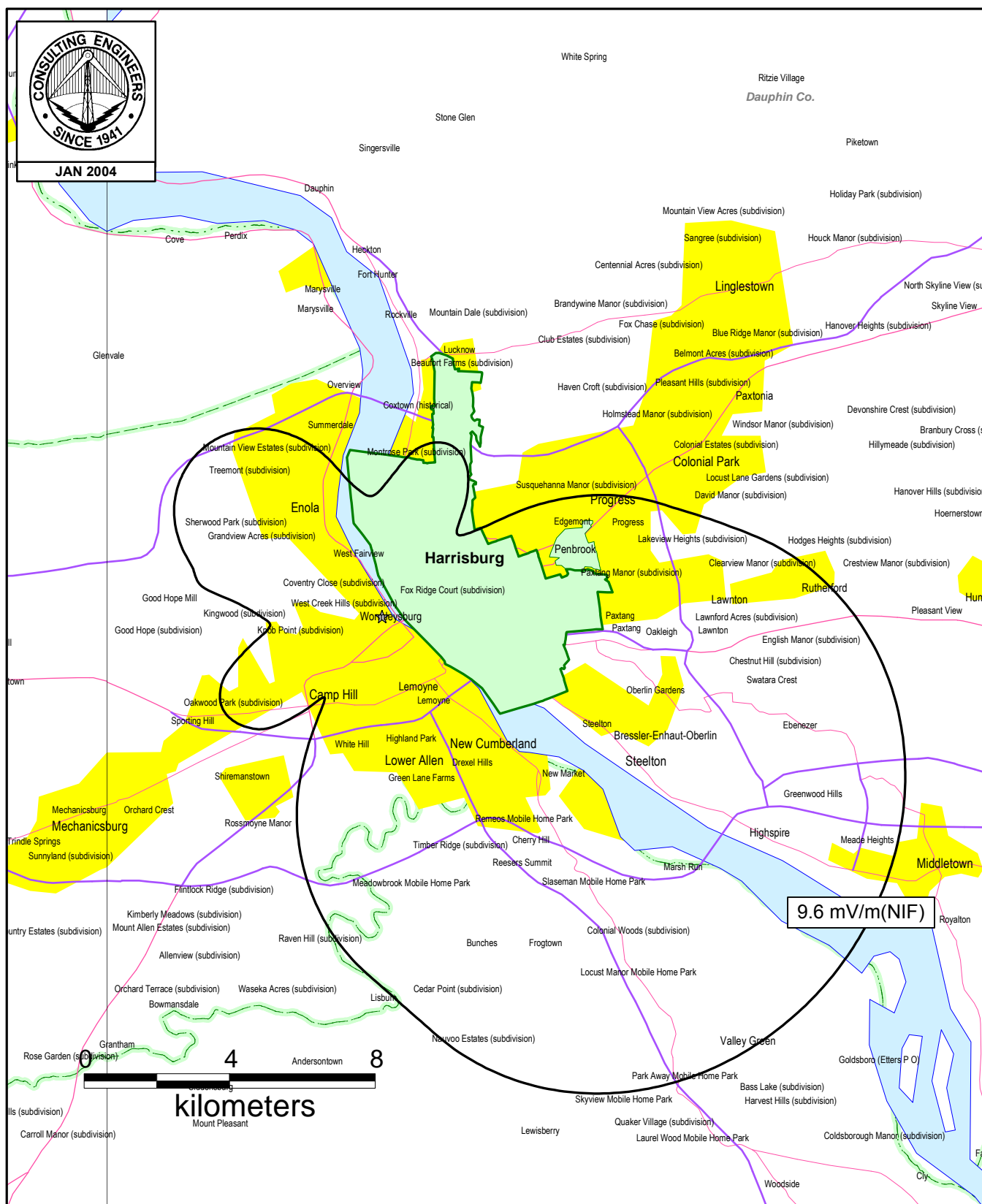
du Treil, Lundin & Rackley, Inc. Sarasota, Florida



## EXISTING NIGHTTIME FIELD STRENGTH CONTOURS

RADIO STATION WKTK  
HARRISBURG, PENNSYLVANIA  
1460 KHZ 2.4 KW-D, 4.2 KW-N U DA-N

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



## EXISTING NIGHTTIME FIELD STRENGTH CONTOURS

RADIO STATION WTKT  
HARRISBURG, PENNSYLVANIA  
1460 KHZ 2.4 KW-D, 4.2 KW-N U DA-N

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

TECHNICAL EXHIBIT  
APPLICATION FOR CONSTRUCTION PERMIT  
RADIO STATION WTKT  
HARRISBURG, PENNSYLVANIA

1460 KHZ 2.4 KW-D; 4.2 W-N U DA-N

Nighttime Allocation Study

# RSS Calculation To WTKT

To Station (Call) WTKT	40-18-32	076-56-13					
From Station(Call)	WHIC	WIFI	WEMR	WBNS	WEMD	WKDV	WMBA
Frequency(kHz)	1460.000	1460.000	1460.000	1460.000	1460.000	1460.000	1460.000
G.C. Distance(km)	315.800	183.700	161.300	508.900	186.100	180.200	278.000
Slant Distance (km)	373.802	271.548	256.965	546.786	273.200	269.230	342.496
Bearing degrees	170.174	278.605	210.545	83.604	337.069	15.746	95.290
Mid-Pt Latitude(deg)	41.710	40.200	40.940	40.170	39.540	39.530	40.460
Geo. M.P. Lat.	53.060	51.600	52.320	51.410	50.920	50.890	51.760
Min-Angle(deg)	23.790	37.660	41.370	14.640	37.290	38.200	26.740
Max-Angle(deg)	36.400	52.030	55.600	24.000	51.660	52.560	40.050
Horiz. Rad (mV/m)	147.780	41.760	144.540	287.210	119.290	84.960	144.350
Max Vert. Rad. (mV/m)	134.071	78.861	71.409	211.312	64.998	59.783	73.621
Skywave Mult.	187.602	307.708	330.172	107.544	307.156	313.660	219.207
Night Limit (mV/m)	5.030	4.853	4.715	4.545	3.993	3.750	3.228
From Station(Call)	WZNZ	WDDY	WBCU	WRAD	CJOY	WKAM	WPON
Frequency(kHz)	1460.000	1460.000	1460.000	1460.000	1460.000	1460.000	1460.000
G.C. Distance(km)	1191.900	366.500	747.900	472.800	446.800	758.700	600.600
Slant Distance (km)	1208.550	417.525	774.220	513.319	489.538	784.602	633.061
Bearing degrees	20.106	226.481	32.429	40.768	141.102	97.881	112.230
Mid-Pt Latitude(deg)	35.340	41.480	37.540	38.740	41.910	41.030	41.470
Geo. M.P. Lat.	46.610	52.890	48.810	50.040	53.210	52.210	52.710
Min-Angle(deg)	4.200	20.610	9.210	15.870	16.850	9.030	12.120
Max-Angle(deg)	8.650	32.270	16.030	25.740	27.130	15.770	20.340
Horiz. Rad (mV/m)	439.190	93.980	168.570	105.360	33.820	173.070	114.240
Max Vert. Rad. (mV/m)	435.969	87.024	161.263	84.350	80.395	162.843	110.463
Skywave Mult.	32.285	158.790	65.080	122.282	122.421	57.484	81.493
Night Limit (mV/m)	2.815	2.764	2.099	2.063	1.968	1.872	1.800

## RSS Night Limit to station

50 % Exclusion = 09.578 mV/m from WHIC      WIFI      WEMR      WBNS  
 25 % Exclusion = 11.496 mV/m from WHIC      WIFI      WEMR      WBNS      WEMD      WKDV      WMBA  
 0 % Exclusion = 15.239

\* - enters the 25% RSS calculation  
 \*\* - enters the 50% RSS calculation

**Figure 12**  
**Sheet 3 of 5**

Night Permissible Vertical Radiation From Station:WTKT  
Coordinates: 40-18-32 076-56-13

Toward Station	Freq. (kHz)	GC Dist. (km)	Bear (degT)	Angles Min Max (deg) (deg)		Skywav Mult. (mV/m)	50% Ex-RSS (mV/m)	25% Ex-RSS (mV/m)	Req. Prot. (mV/m)	Perm. Vert-Rad mV/m@1km
MEDIC	1460	2821.3	303.7	0.0	0.0	4.17	2.93	4.07	1.46	1756.8
* CJOY	1460	446.8	323.3	22.2	22.2	133.43	14.49	17.39	7.25	271.6
* CJOY	1460	446.8	323.3	22.2	22.2	133.43	14.49	17.39	7.25	271.6
CKRB	1460	822.	35.7	11.3	11.3	84.05	37.49	39.92	18.74	1115.1
HJMN	1460	3577.3	179.4	0.0	0.0	.95	8.69	10.92	4.34	22786.4
HJJH	1460	3983.	177.9	0.0	0.0	.76	8.22	10.79	4.11	27162.7
HJJW	1460	3976.7	175.1	0.0	0.0	.76	10.56	11.89	5.28	34790.1
HJZU	1460	4351.9	180.5	0.0	0.0	.63	7.38	8.61	3.69	29506.1
HJFL	1460	4274.4	179.	0.0	0.0	.65	10.6	11.4	5.30	40769.5
HJAL	1460	3450.8	177.1	0.0	0.0	1.03	8.64	10.64	4.32	20881.1
HJTF	1460	3803.4	179.5	0.0	0.0	.83	9.15	11.69	4.57	27591.4
HJMY	1460	3643.5	171.5	0.0	0.0	.91	8.79	11.16	4.39	24061.2
TILX	1460	3415.2	194.5	0.0	0.0	1.06	3.58	4.54	1.79	8448.9
CMHZ	1460	2074.	182.4	0.6	0.6	3.74	4.76	5.	2.38	3179.6
HIAN	1460	2507.	160.7	0.0	0.0	2.24	6.43	7.4	3.22	7171.2
HIAR	1460	2520.	163.	0.0	0.0	2.21	6.47	7.45	3.23	7310.1
TGRN	1460	2884.4	209.4	0.0	0.0	1.57	4.5	5.45	2.25	7155.3
4VEA	1460	2330.1	167.4	0.0	0.0	2.72	7.47	8.17	3.73	6875.7
HRQX	1460	3064.9	202.6	0.0	0.0	1.36	3.68	3.86	1.84	6748.5
HRIC	1460	2919.5	204.5	0.0	0.0	1.53	4.19	4.36	2.09	6862.8
XE	1460	2952.5	248.9	0.0	0.0	3.73	12.23	14.27	6.12	8195.5
XEYC	1460	2804.6	259.4	0.0	0.0	4.23	7.73	10.93	3.86	4569.4
XEYC	1460	2804.6	259.4	0.0	0.0	4.23	7.73	10.93	3.86	4569.4
XEPD	1460	2616.9	245.8	0.0	0.0	5.02	10.48	14.55	5.24	5221.1
XEUJ	1460	2798.5	214.9	0.0	0.0	4.25	10.4	11.98	5.20	6113.7
XE	1460	3080.8	243.4	0.0	0.0	3.39	14.89	16.8	7.45	10990.6
XEGRA	1460	3407.3	226.9	0.0	0.0	2.67	33.32	33.32	16.66	31154.6
XEHE	1460	3268.8	235.4	0.0	0.0	2.95	27.11	28.45	13.55	22973.7
XELX	1460	3187.	231.2	0.0	0.0	3.12	14.17	17.83	7.09	11352.5
XE0023	1460	3359.6	240.	0.0	0.0	2.77	21.39	23.64	10.70	19329.6
XEKC	1460	3207.6	222.	0.0	0.0	3.07	17.81	21.68	8.91	14485.2
XECPQ	1460	2538.6	207.9	0.0	0.0	5.45	9.74	11.14	4.87	4471.5
XEXQ	1460	3030.5	235.5	0.0	0.0	3.51	14.36	18.02	7.18	10222.5
XEHX	1460	3331.8	255.2	0.0	0.0	2.82	9.46	12.58	4.73	8378.4
XEARF	1460	3147.3	259.8	0.0	0.0	3.22	8.79	12.32	4.40	6826.1
XEOLA	1460	2809.9	230.7	0.0	0.0	4.21	13.37	15.83	6.68	7938.7
XEJH	1460	2991.	225.3	0.0	0.0	3.62	13.89	17.32	6.94	9596.9
YNRV1	1460	3249.5	200.2	0.0	0.0	1.19	2.89	3.73	1.44	6070.1
HOO 42	1460	3491.6	190.4	0.0	0.0	1.01	5.16	6.28	2.58	12819.8
GRDTK	1460	2168.6	163.7	0.2	0.2	3.31	3.66	5.09	1.83	2763.9
WMCJ	1460	1110.6	235.3	4.9	9.6	34.51	9.72	12.83	3.21	464.7
WHAL	1460	1130.7	221.8	4.7	9.4	34.35	9.41	12.13	3.03	441.5
KTYM	1460	3702.3	272.5	0.0	0.0	2.95	7.13	8.03	2.01	3404.2
KTYM	1460	3702.3	272.5	0.0	0.0	2.95	7.13	8.03	2.01	3404.2
KION	1460	3863.3	278.8	0.0	0.0	2.34	3.16	4.82	1.20	2579.3
KCNR	1460	3802.	285.6	0.0	0.0	1.98	6.61	6.82	1.70	4297.4
KZNT	1460	2378.7	275.1	0.0	0.4	6.95	8.58	11.83	2.96	2127.8
WZNZ	1460	1191.7	202.9	4.2	8.7	32.29	7.68	9.13	2.28	353.4
WXEM	1460	927.5	224.4	6.7	12.4	46.66	14.13	16.86	4.21	451.6
KHRA	1460	7747.8	281.2	0.0	0.0	.63	1.8	2.02	.50	3984.6
KXNO	1460	1398.9	281.5	2.7	6.5	19.23	3.53	4.7	1.17	305.4
WKAM	1460	758.5	283.7	9.0	15.8	57.51	10.99	12.99	3.25	282.5
WXOK	1460	1689.9	234.1	1.1	4.2	17.35	7.77	10.07	2.52	725.2

\* - enters the 25% RSS calculation  
\*\* - enters the 50% RSS calculation

**Figure 12**  
**Sheet 4 of 5**

Night Permissible Vertical Radiation From Station:WTKT  
Coordinates: 40-18-32 076-56-13

Toward Station	Freq. (kHz)	GC Dist. (km)	Bear (degT)	Angles		Skywav Mult. (mV/m)	50% Ex-RSS (mV/m)	25% Ex-RSS (mV/m)	Req. Prot. (mV/m)	Perm. Vert-Rad mV/m@1km
				Min (deg)	Max (deg)					
KBSF	1460	1679.7	246.3	1.1	4.3	16.72	10.42	12.43	3.11	928.7
**WBET	1460	528.9	66.6	14.0	23.1	98.45	17.8	20.04	9.22	468.4
**WEMD	1460	186.1	156.5	37.3	51.7	307.17	44.07	48.68	44.07	717.3
WBRN	1460	798.1	300.7	8.4	14.9	50.66	25.24	26.17	6.54	645.8
WPON	1460	600.5	296.6	12.1	20.3	81.55	16.8	20.96	5.24	321.3
KDMA	1460	1618.	294.7	1.4	4.8	12.79	12.59	13.91	3.48	1359.1
WEWO	1460	654.6	201.1	10.9	18.6	79.41	21.39	24.26	6.07	381.9
KLTC	1460	2196.4	297.9	0.0	1.3	5.87	4.97	5.37	1.34	1145.
*WIFI	1460	183.9	97.2	37.6	52.0	307.51	39.51	42.4	39.51	642.4
KENO	1460	3343.6	274.6	0.0	0.0	3.47	5.33	6.57	1.64	2368.4
* WDDY	1460	366.7	44.4	20.6	32.3	158.69	7.05	8.89	2.60	82.
* WHIC	1460	315.9	350.6	23.8	36.4	187.57	8.42	10.51	3.56	95.
WBNS	1460	508.7	267.5	14.7	24.0	107.61	5.56	7.72	1.93	89.7
**WBKC	1460	393.9	295.2	19.2	30.4	147.36	11.74	14.09	6.81	230.9
* WMBA	1460	277.8	277.4	26.8	40.1	219.37	9.22	12.91	4.20	95.8
WTKT	1460	5.4	.	0.0	0.0	.	9.67	11.58	2.89	95.8
*WEMR	1460	161.5	30.	41.3	55.6	329.96	13.03	15.56	7.96	120.7
WRRE	1460	2673.8	153.5	0.0	0.0	8.66	15.33	18.28	4.57	2638.3
WLRP	1460	2620.5	155.8	0.0	0.0	8.99	14.7	18.78	4.69	2610.1
WBCU	1460	747.7	215.3	9.2	16.0	65.11	14.15	16.23	4.06	311.6
KTFW	1460	2005.7	251.1	0.0	2.3	11.97	16.93	19.01	4.75	1985.2
KBRZ	1460	2094.2	238.8	0.0	1.8	11.86	23.74	23.74	5.94	2503.4
KCWM	1460	2352.4	245.8	0.0	0.5	9.35	10.34	13.65	3.41	1825.3
KBZO	1460	2326.5	259.1	0.0	0.6	8.63	14.53	16.73	4.18	2423.6
KTFW	1460	2055.7	248.	0.0	2.0	11.67	15.87	18.33	4.58	1963.2
*WKDV	1460	180.1	196.	38.2	52.6	313.83	13.79	17.01	13.79	219.7
WRAD	1460	472.5	223.	15.9	25.8	122.36	13.08	16.01	4.00	163.6
KARR	1460	3654.6	298.3	0.0	0.0	1.36	37.08	37.08	9.27	34102.3
KUTI	1460	3534.4	296.	0.0	0.0	1.65	2.79	3.64	.91	2764.7
YVRJ	1460	3515.8	167.3	0.0	0.0	.99	5.92	7.48	2.96	14954.6
CMHZ	1460	2074.	182.4	0.6	0.6	3.74	4.76	5.	2.38	3179.6
CMHZ	1460	2074.	182.4	0.6	0.6	3.74	4.76	5.	2.38	3179.6
NEW	1470	3082.8	270.5	0.0	0.0	4.39	14.49	16.69	4.17	47498.5
KUTY	1470	3644.1	273.5	0.0	0.0	2.98	27.62	27.62	6.91	115713.
KIID	1470	3786.6	281.9	0.0	0.0	2.24	9.61	11.18	2.79	62409.4
WMMW	1470	374.1	66.9	20.2	31.7	156.8	9.35	11.82	2.95	942.2
WLVU	1470	1461.9	203.1	2.3	6.0	23.36	21.03	21.76	5.44	11643.5
WNNN	1470	1599.8	191.9	1.5	4.9	20.39	13.99	15.06	3.77	9233.5
WBIT	1470	1173.5	211.7	4.4	8.9	32.81	37.14	37.14	9.29	14151.2
WCLA	1470	1007.7	207.7	5.9	11.1	41.76	33.3	34.91	8.73	10449.5
WRGA	1470	986.	230.	6.1	11.4	42.11	10.55	13.25	3.31	3933.9
KWSL	1470	1639.1	284.6	1.3	4.6	13.64	8.	9.13	2.28	8362.7
WCFJ	1470	907.7	281.3	7.0	12.7	42.74	37.12	37.12	9.28	10857.4
WMBD	1470	1065.2	275.7	5.3	10.2	32.91	3.22	4.91	1.23	1865.3
KAIR	1470	1537.5	273.	1.9	5.4	16.93	8.09	9.19	2.30	6784.4
KLCL	1470	1850.8	238.	0.3	3.2	14.68	5.35	7.72	1.93	6572.7
WAZN	1470	502.9	61.2	14.8	24.3	105.28	9.18	10.37	2.59	1231.9
WAZN	1470	532.1	62.	13.9	23.0	97.06	11.29	12.07	3.02	1554.8
WTRR	1470	81.6	184.9	60.3	71.0	424.92	9.55	9.92	2.48	291.9
WLAM	1470	691.	50.6	10.2	17.5	63.06	4.93	7.04	1.76	1396.3
WFNT	1470	630.4	300.2	11.4	19.3	75.14	6.09	8.86	2.22	1474.1
WKLZ	1470	752.5	289.4	9.1	15.9	57.55	16.31	17.12	4.28	3719.1
KLBP	1470	1441.6	297.	2.5	6.2	16.18	33.25	36.08	9.02	27878.1
WNAU	1470	1245.2	242.6	3.8	8.1	28.14	10.95	12.45	3.11	5531.8

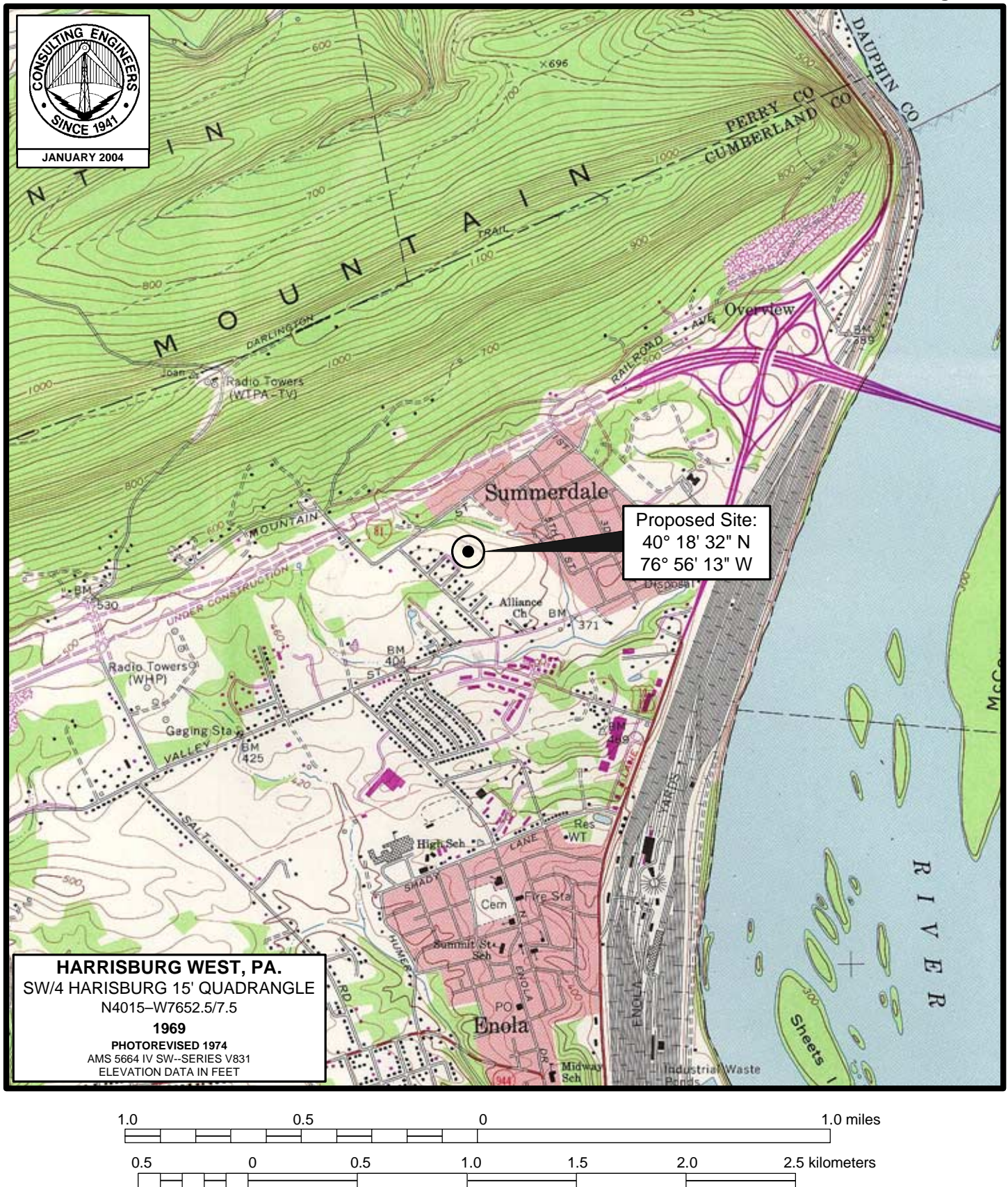
\* - enters the 25% RSS calculation  
\*\* - enters the 50% RSS calculation

Night Permissible Vertical Radiation From Station:WTKT  
Coordinates: 40-18-32 076-56-13

Toward Station	Freq. (kHz)	GC Dist. (km)	Bear (degT)	Angles		Skywav Mult. (mV/m)	50% Ex-RSS (mV/m)	25% Ex-RSS (mV/m)	Req. Prot. (mV/m)	Perm. Vert-Rad mV/m@1km
				Min (deg)	Max (deg)					
WWBG	1470	530.1	210.3	14.0	23.1	105.79	4.91	6.53	1.63	772.
WTKO	1470	234.9	9.3	31.0	45.0	251.86	12.91	13.79	3.45	684.3
WLQR	1470	568.	287.1	12.9	21.5	89.86	8.87	10.11	2.53	1406.8
*WKAP	1470	128.3	73.	48.0	61.5	370.62	3.31	4.69	1.59	214.
WLOA	1470	317.6	289.3	23.7	36.2	190.17	9.24	11.52	2.88	757.1
WKCK	1470	2650.3	154.6	0.0	0.0	8.81	13.37	14.77	3.69	20966.9
WVOL	1470	972.1	245.1	6.2	11.6	41.91	10.38	13.17	3.29	3929.3
KVVZ	1470	2210.4	254.1	0.0	1.2	9.86	6.18	7.84	1.96	9941.
KUOL	1470	2222.7	245.2	0.0	1.1	10.35	18.3	19.93	4.98	24062.4
KUOL	1470	2222.6	245.1	0.0	1.1	10.36	18.24	19.88	4.97	23993.1
KACE	1470	2935.7	284.4	0.0	0.0	3.75	6.8	8.01	2.00	26721.6
KELA	1470	3723.5	296.6	0.0	0.0	1.39	5.5	5.7	1.43	51474.1
KBSN	1470	3442.4	297.	0.0	0.0	1.72	11.17	11.17	2.79	81392.1
WBKV	1470	989.3	293.8	6.1	11.3	35.11	39.61	45.65	11.41	16251.9
KKTY	1470	2372.2	286.	0.0	0.4	5.96	3.21	4.43	1.11	9307.5

\* - enters the 25% RSS calculation  
\*\* - enters the 50% RSS calculation





**TRANSMITTER SITE LOCATION**  
**RADIO STATION WTKT**  
**HARRISBURG, PENNSYLVANIA**  
**1460 KHZ 2.4 KW-D 4.2 KW-N U DA-N**  
 du Treil, Lundin & Rackley, Inc. Sarasota, Florida





VIEW LOOKING NORTH

## **SITE PHOTOGRAPHS**

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RADIO STATION WTKT  
HARRISBURG, PENNSYLVANIA  
1460 KHZ 2.4 KW-D, 4.2 KW-N U DA-N

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



VIEW LOOKING NORTHEAST

### **SITE PHOTOGRAPHS**

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RADIO STATION WTKT  
HARRISBURG, PENNSYLVANIA  
1460 KHZ 2.4 KW-D, 4.2 KW-N U DA-N

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



VIEW LOOKING EAST

## **SITE PHOTOGRAPHS**

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RADIO STATION WTKT  
HARRISBURG, PENNSYLVANIA  
1460 KHZ 2.4 KW-D, 4.2 KW-N U DA-N

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





VIEW LOOKING SOUTHEAST

### **SITE PHOTOGRAPHS**

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RADIO STATION WTKT  
HARRISBURG, PENNSYLVANIA  
1460 KHZ 2.4 KW-D, 4.2 KW-N U DA-N

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



VIEW LOOKING SOUTH

### **SITE PHOTOGRAPHS**

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RADIO STATION WTKT  
HARRISBURG, PENNSYLVANIA  
1460 KHZ 2.4 KW-D, 4.2 KW-N U DA-N

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



VIEW LOOKING SOUTHWEST

### **SITE PHOTOGRAPHS**

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RADIO STATION WTKT  
HARRISBURG, PENNSYLVANIA  
1460 KHZ 2.5 KW-D, 4.2 KW-N U DA-N

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





VIEW LOOKING WEST

## **SITE PHOTOGRAPHS**

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RADIO STATION WTKT  
HARRISBURG, PENNSYLVANIA  
1460 KHZ 2.4 KW-D, 4.2 KW-N U DA-N

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





VIEW LOOKING NORTHWEST

### **SITE PHOTOGRAPHS**

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RADIO STATION WTKT  
HARRISBURG, PENNSYLVANIA  
1460 KHZ 2.4 KW-D, 4.2 KW-N U DA-N

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