

ENGINEERING EXHIBITS
IN SUPPORT OF COMMENTS OF
THE AM RADIO PRESERVATION ALLIANCE
IN MB DOCKET NO. 13-249

WBT(AM), Charlotte, North Carolina

JANUARY 2019

The attached engineering exhibits have been prepared on behalf of the AM Radio Preservation Alliance (AMRPA) to document the impact on AM radio service during nighttime, critical hours and daytime operations, respectively, if certain changes to the AM protection rules currently enforced by the Federal Communication Commission (FCC), under consideration in MB Docket No. 13-249, were adopted.¹ These exhibits clearly validate that there would be minimal theoretical gains in radio service provided by other AM stations at the expense of new interference to vastly more populations currently reached by established Class A AM radio service.

In this set of engineering exhibits, interference and coverage studies were conducted analyzing Class A AM Station WBT, Charlotte, North Carolina, FCC Facility ID No. 30830, in regard to its nighttime (Figures 1-N through 13-N), critical hours (Figures 1.1-C through 2.3-C) and daytime operations (Figures 1-D through 6-D), applying the FCC's reduced protection requirements to Class A AM stations as proposed in the *SFNPRM*.²

As detailed further below, Figure 1-N documents the negative impact on the studied Class A AM station's nighttime signal from nearby non-Class A AM stations adding nighttime coverage assuming the *SFNPRM*'s Alternative 1 for nighttime hours protection to Class A AM stations (protection of 0.5 mV/m groundwave contour) was adopted, while Figures 2-N through 13-N show the theoretical additional service if neighboring non-Class A AM stations were to add nighttime coverage under Nighttime

¹ See *Revitalization of the AM Radio Service*, Second Further Notice of Proposed Rulemaking, FCC 18-139, MB Docket No. 13-249 (rel. Oct. 5, 2018) ("*SFNPRM*").

² These interference studies were conducted using computer software V-Soft AMpro2's incoming interference study program, combining interfering signal strength using the RSS methodology with a 50% minimum level for inclusion and a buffer grid size of 500x500.

Alternative 1.³ Following these figures are contour maps (prepared by iHeartMedia's engineering staff) mapping these non-Class A AM station's theoretical nighttime AM gain areas in comparison with such station's licensed or permitted FM translator service area (60 dBu contour), where applicable,⁴ along with a chart summarizing the actual FM translator population served in contrast to the theoretical nighttime AM gains coming at the expense of more interference on the AM band.

Figures 1.1-C, 1.2-C and 1.3-C address the studied Class A AM station during critical hours periods under Alternative 1 (Class A AM stations afforded no protection from other AM stations during critical hours). Figures 2.1-C, 2.2-C and 2.3-C document the studied Class A AM station during critical hours periods under Alternative 2 of the *SFNPRM* (protection of a Class A AM station during critical hours only to its 0.5 mV/m groundwave contour by amending 47 C.F.R. Section 73.190 critical hours figures to reference the distance from the Class A AM station's 0.5 mV/m contour in lieu of its 0.1 mV/m contour). These Critical Hours Alternative 1 and Alternative 2 studies reflect increasing interference (shaded red) to currently served populations by the studied Class A AM station at the intervals of one-hour, one-half hour, and one-quarter hour before sunset.

Daytime operations under the *SFNPRM* proposal are addressed in Figures 1-D through 6-D. Figure 1-D documents the daytime operations of the studied Class A AM station as currently protected (to its 0.1 mV/m daytime groundwave contour), as well

³ Based on a sampling analysis, *SFNPRM* Nighttime Alternative 2 generally is expected to authorize even more interference to the listeners of Class A AM stations than pursuant to *SFNPRM* Nighttime Alternative 1.

⁴ In situations where the non-Class A AM station has more than one FM translator authorization, only the FM translator facility closest to the theoretical nighttime AM gain area has been mapped.

as the predicted interference within that contour that would result if nearby AM stations operated with the maximum powers permitted in the direction of the studied Class A AM station as proposed in the *SFNPRM* (protecting only the 0.5 mV/m daytime groundwave contour of the Class A AM station). Figures 2-D through 6-D document the potential daytime population gain – solely in the direction of the studied Class A AM station as other stations may limit power gains in other directions – for the individual interfering stations, assuming the daytime protection to only the 0.5 mV/m groundwave contour was adopted as proposed in the *SFNPRM*.

Following the Figures are charts tabulating the results of these nighttime, critical hours and daytime studies.

In addition, the summary pages of the “Grid Based Incoming Interference Population Report(s)” conducted for the nighttime, critical hours and daytime analysis of the studied Class A AM station are also attached. Due to their length, only the summaries, and not the entire Grid Based Incoming Interference Population Report(s) are attached; the entire Report(s) are available upon the request of the FCC or any interested party.

Below is a summary of the methodology of the conducted coverage and interference studies in regard to the studied Class A AM station as documented in the attached figures and charts:

Nighttime

Figure 1-N maps the studied Class A AM station’s nighttime 0.5 mV/m 50% skywave contour (red line), which is currently protected, along with the Class A AM station’s nighttime 0.5 mV/m groundwave contour (blue line) which is proposed to be protected under Nighttime Alternative 1 of the *SFNPRM*. The resulting zone subject to new interference from co-channel Class D stations adding nighttime operations is shown in

red shading, and the currently-served population and population subject to such new interference are detailed in red on Figure 1-N. In determining the interference to the studied Class A AM station, the nighttime operation for each impinging Class D AM station is based on protecting the 0.5 mV/m groundwave contour of the studied Class A AM station pursuant to Nighttime Alternative 1 of the *SFNPRM*. Generally, the impinging Class D AM stations are non-directional. In those few instances where the Class D AM station employs a directional pattern, the presumed Class D AM station power has been limited in the direction of the studied Class A AM station's 0.5 mV/m groundwave contour and has not been verified for protection limits in other directions.

Figures 2-N through 13-N show the nighttime interference-free contour for each co-channel Class D interfering AM station assuming nighttime operations with maximum permissible power, while protecting only the nighttime 0.5 mV/m groundwave contour of the studied Class A AM station pursuant to Nighttime Alternative 1 of the *SFNPRM*. The potential nighttime population and area gains resulting from such co-channel Class D stations operating with maximum allowed power in the direction of the studied Class A AM station's protected 0.5 mV/m groundwave contour is also detailed in red on each figure. A tabulation of the nighttime study results is provided following all the figures.

Critical Hours

Figures 1.1-C through 1.3-C and Figures 2.1-C through 2.3-C each show the daytime 0.1 mV/m groundwave contour (blue line) and the 0.5 mV/m groundwave contour (red line) of the studied Class A AM station. There are three studies in each set, employing skywave diurnal factors (FCC Section 73.190 Figure 13) for the time frames of (i) one hour prior to sunset (SS-1), (ii) ½ hour prior to sunset (SS-0.5), and (iii) ¼ hour prior to sunset (SS-0.25). Predicted interference within the respective contours is shown in red shading.

Under Critical Hours Alternative 1 of the *SFNPRM*, neighboring stations to a Class A AM station (which in this instance are Class D stations) could continue to operate at full daytime power during critical hours. The interference to the studied Class A AM station from such unrestricted power operations of its neighbors during critical hours per Alternative 1 of the *SFNPRM* is documented in red shading on Figures 1.1-C, 1.2-C and 1.3-C, for each respective time period (one hour, ½ hour and ¼ hour prior to sunset).

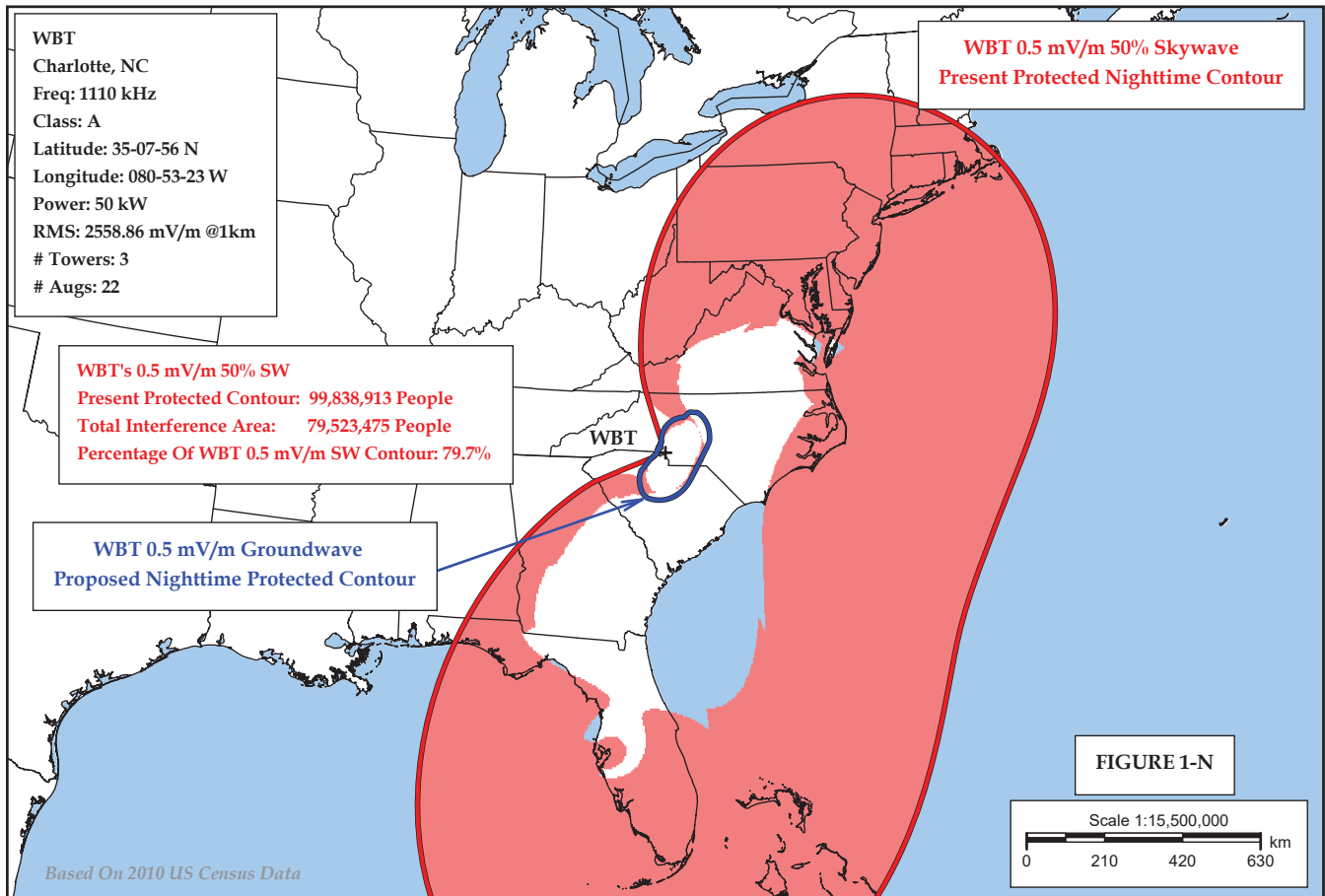
Pursuant to Critical Hours Alternative 2 of the *SFNPRM*, the Commission would change the vertical axis reference for application of Figures 9, 10 and 11 of 47 C.F.R. Section 73.190 from "Distance from 0.1 mV/m Contour in Miles" to "Distance from 0.5 mV/m Contour in Miles." The interference to the studied Class A AM station from such revised permissible power calculations for its neighbors during critical hours per Alternative 2 of the *SFNPRM* is documented in red shading on Figures 2.1-C, 2.2-C and 2.3-C, for each respective time period (one hour, ½ hour and ¼ hour prior to sunset).

The box on the upper left-hand corner of each Critical Hours figure sets forth the data for the population, area and percentage impact of the resulting interference under the reviewed Critical Hours Alternative on the studied Class A AM station's 0.1 mV/m contour; the box on the upper right-hand corner, on the studied Class A AM station's 0.5 mV/m contour. A tabulation of the critical hours study results is provided following all the figures.

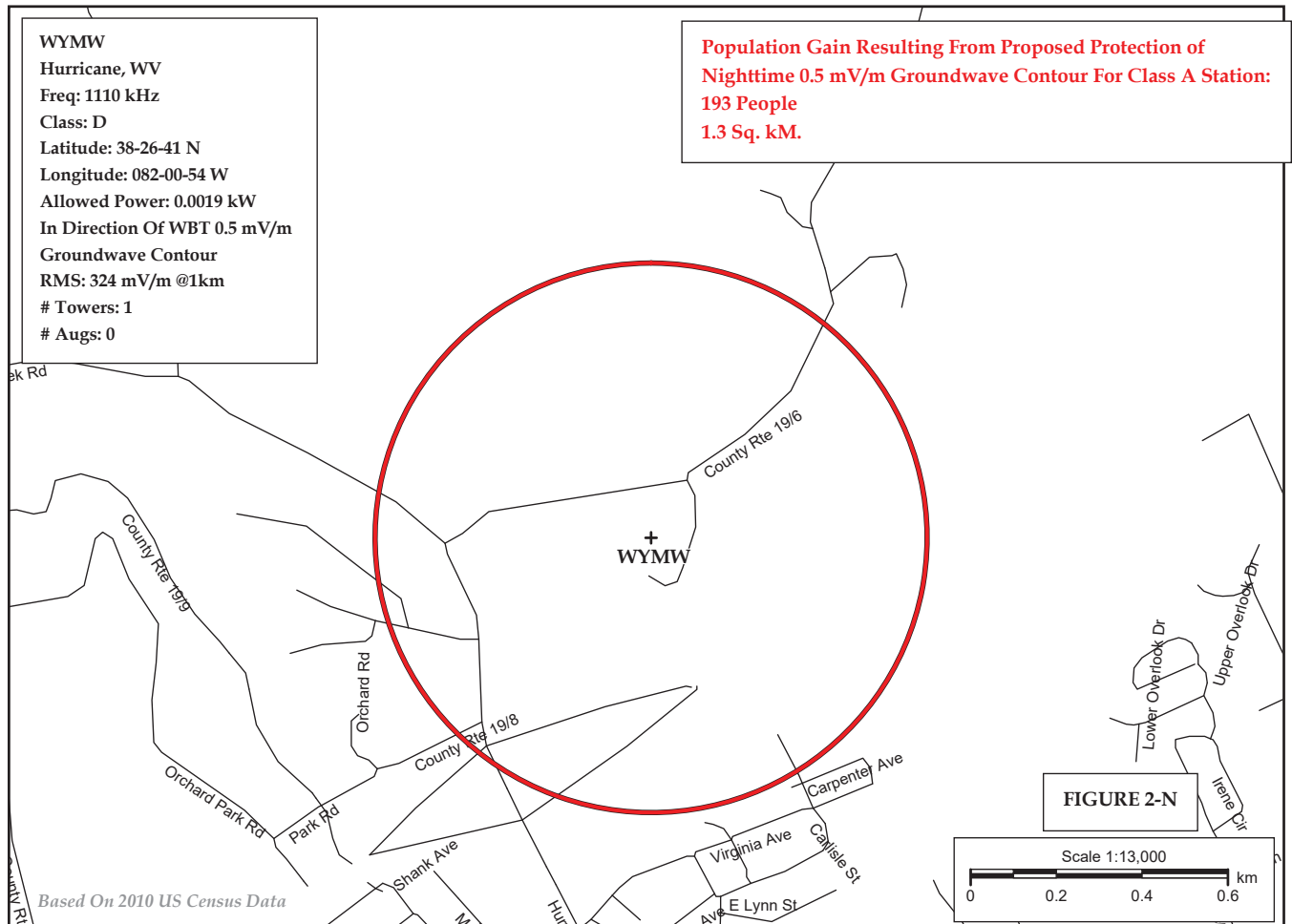
Daytime

For the studied Class A AM station, Figure 1-D maps the present daytime protected 0.1 mV/m groundwave contour (blue line) as well as the less-encompassing daytime 0.5 mV/m groundwave contour (red line) proposed to be protected from co-channel interference in the *SFNPRM*. The interference area resulting from nearby co-channel stations (typically Class D AM stations) operating with maximum potential power (up to 50 kW) in the direction of the studied Class A AM daytime 0.5 mV/m groundwave contour is shown in red shading. The box at the upper right-hand corner of Figure 1-D details the currently protected population within the studied Class A AM station's daytime 0.1 mV/m groundwave contour, the population within that contour that would be subject to interference if only the daytime 0.5 mV/m groundwave contour is protected as proposed in the *SFNPRM*, and the percentage of the current population now served that such interference zone encompasses.

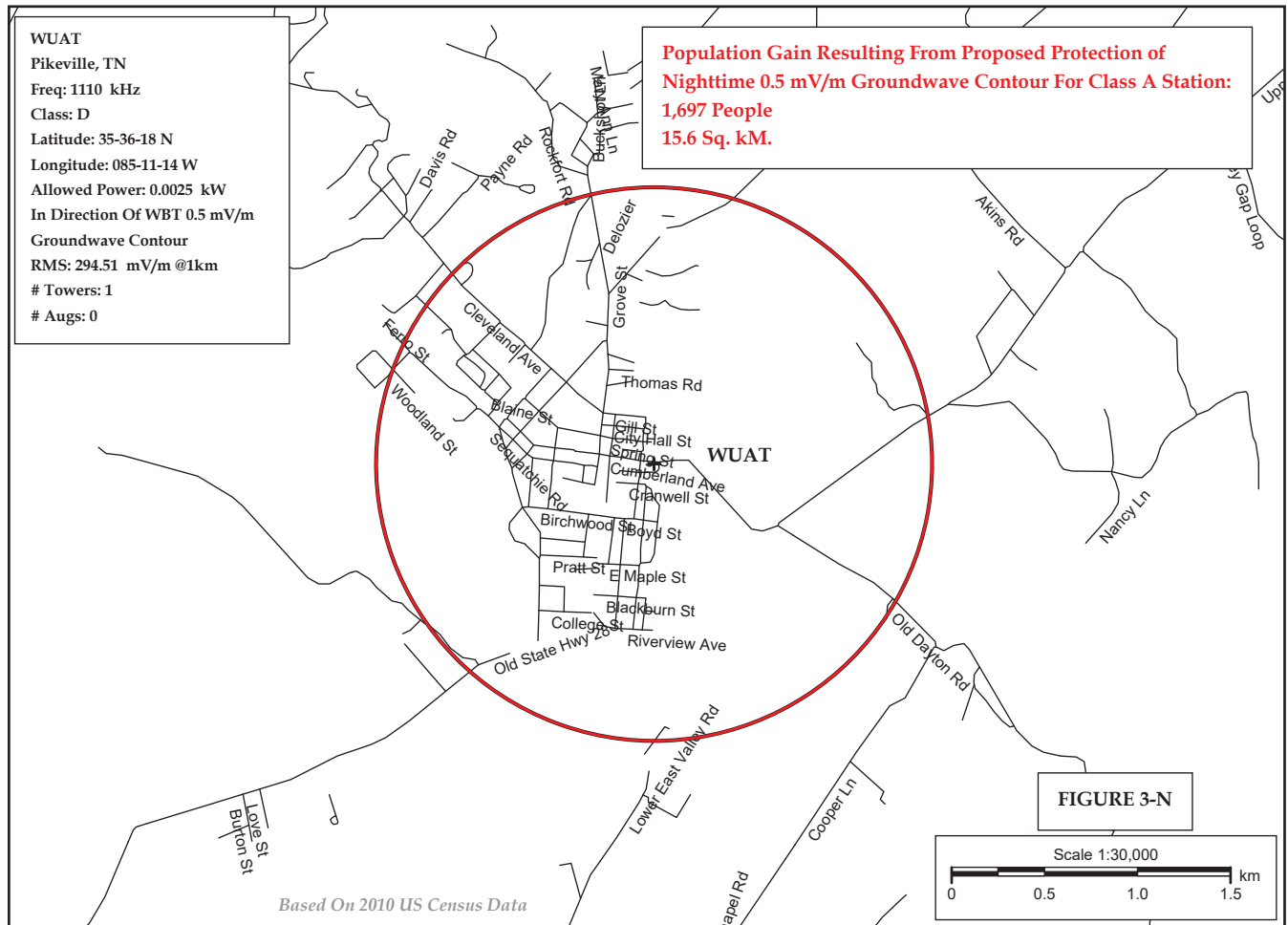
Figures 2-D through 6-D document the potential daytime population gain for the individual interfering stations in the direction of the studied Class A AM station with daytime protection to the Class A AM station's 0.5 mV/m groundwave contour, as proposed in the *SFNPRM*. The boundaries for the gain areas are the difference between the licensed and potential 0.5 mV/m groundwave contours of the interfering station through the arc of the Class A AM station's protected 0.5 mV/m groundwave contour, as detailed on each of Figures 2-D through 6-D. Individually and collectively, the potential daytime population gains by the interfering stations in the direction of the now-limiting Class A AM station under the *SFNPRM* daytime proposal constitutes a tiny percentage of the population that would be subject to new interference to their daytime reception of the studied Class A AM station. A tabulation of the daytime study results is provided following all the figures.



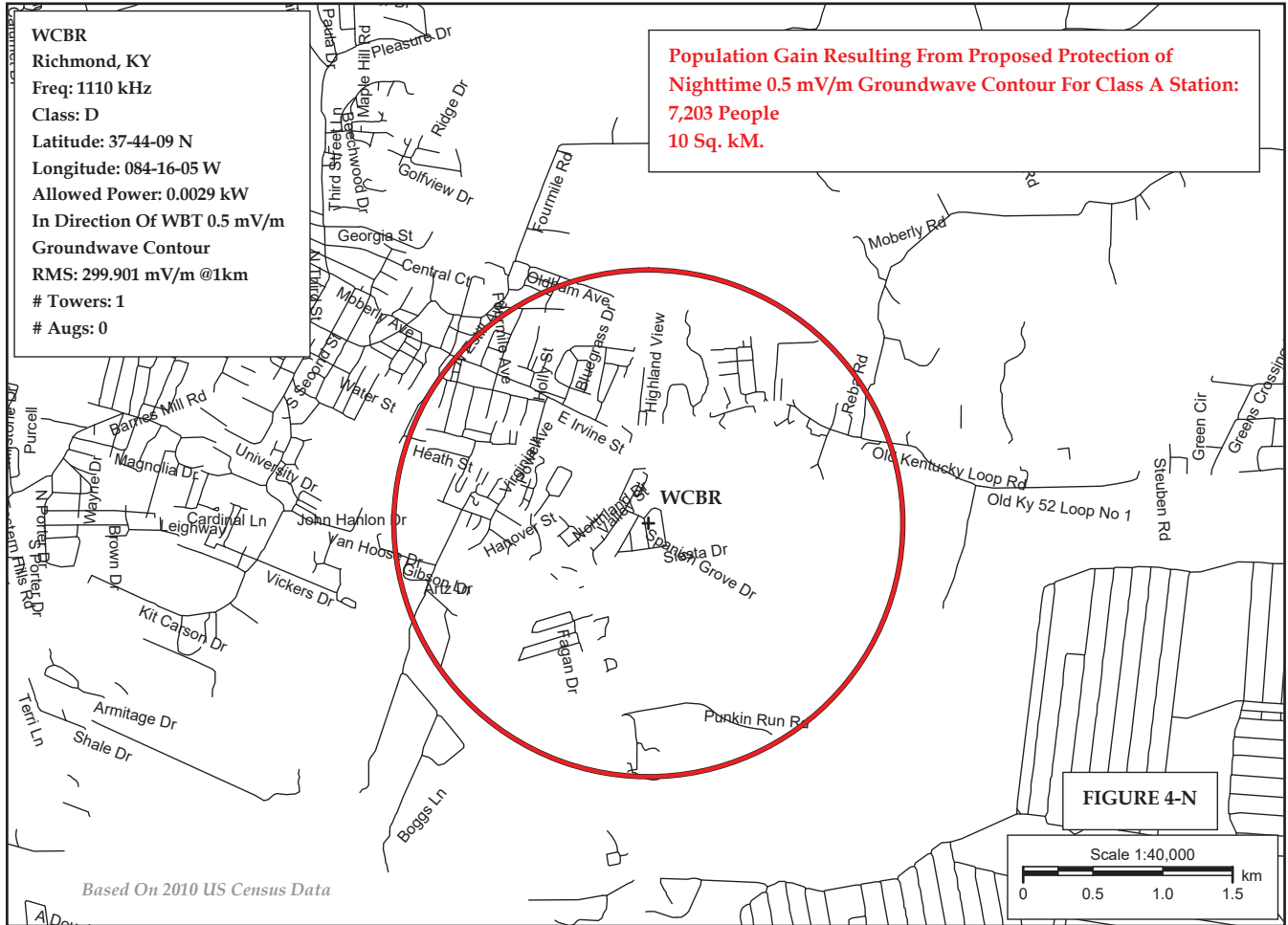
Predicted Nighttime Interference Area To The Present Protected WBT 0.5 mV/m 50% Skywave Nighttime Contour From Class D Stations WTBQ, WYMW, WUAT, WCBR, WKQA, WTIS, WNAP, WUNN, WJSM, WGNZ, WFSW And WSLV Operating With Maximum Allowed Power In The Direction Of WBT's 0.5 mV/m Groundwave Contour



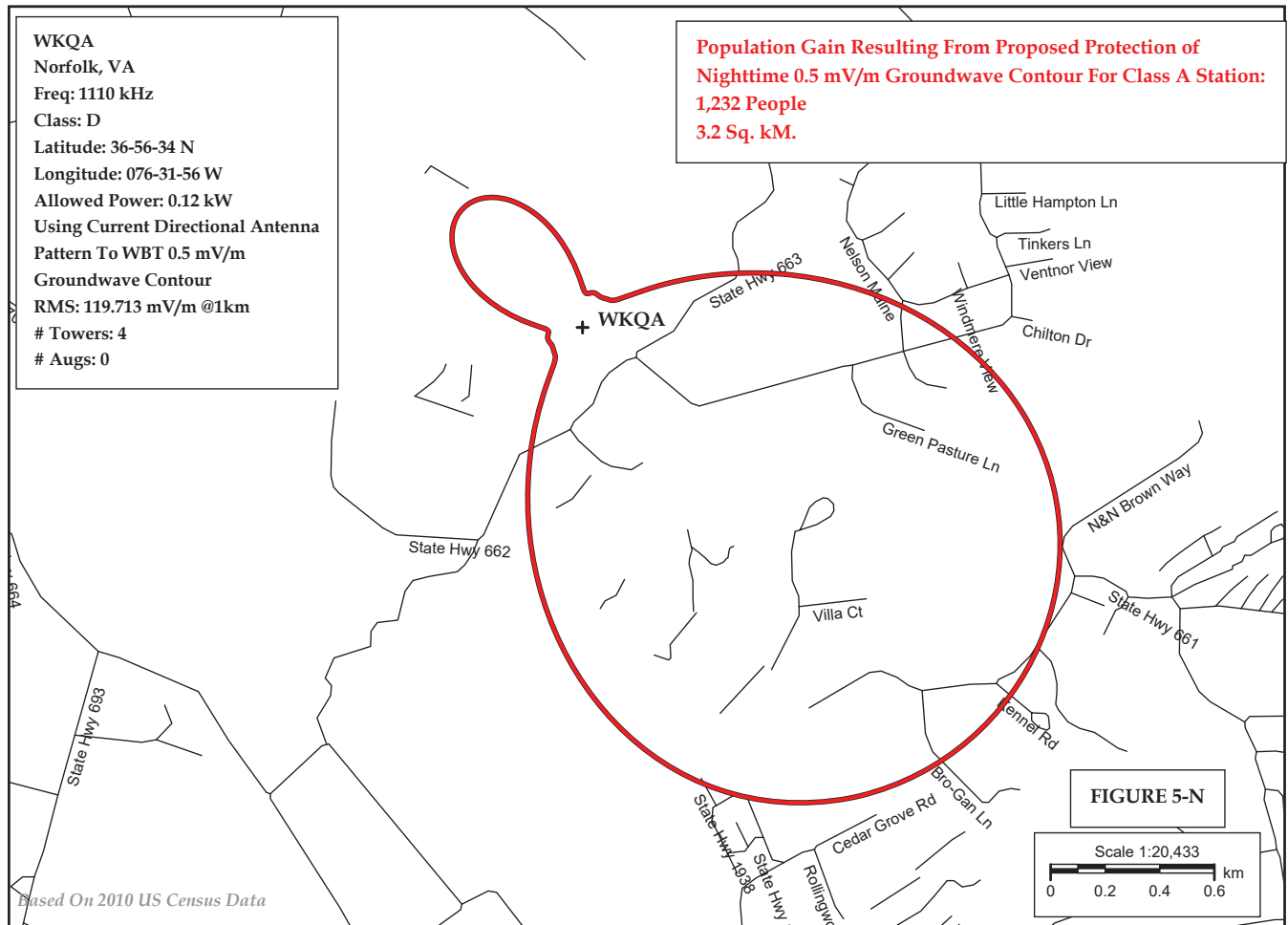
WYMW NIF 16.8 mV/m Groundwave Contour With Protection To Class A Station WBT's Proposed Protected 0.5 mV/m Groundwave Nighttime Contour



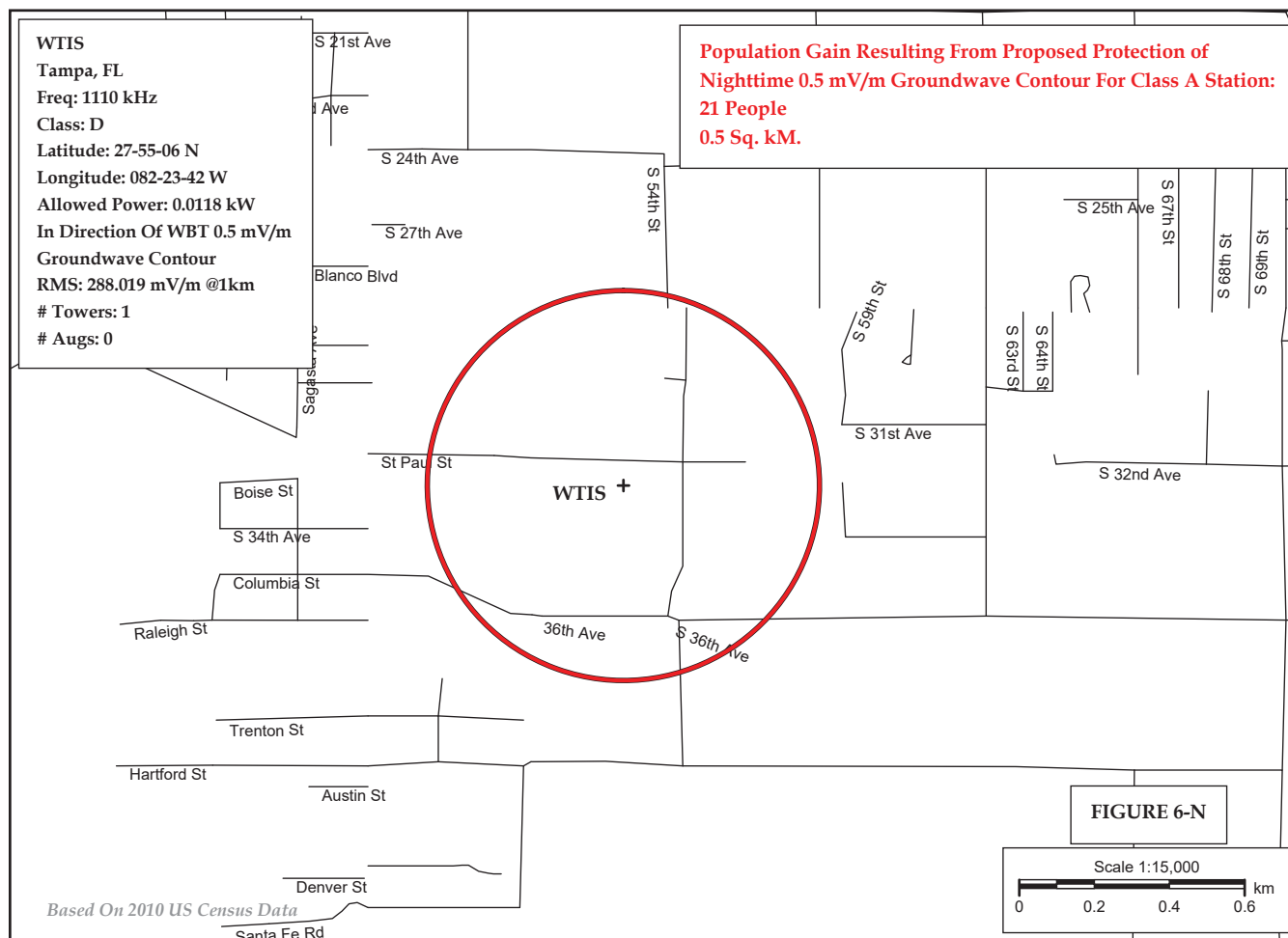
WUAT NIF 6.4 mV/m Groundwave Contour With Protection To Class A Station WBT's Proposed Protected 0.5 mV/m Groundwave Nighttime Contour



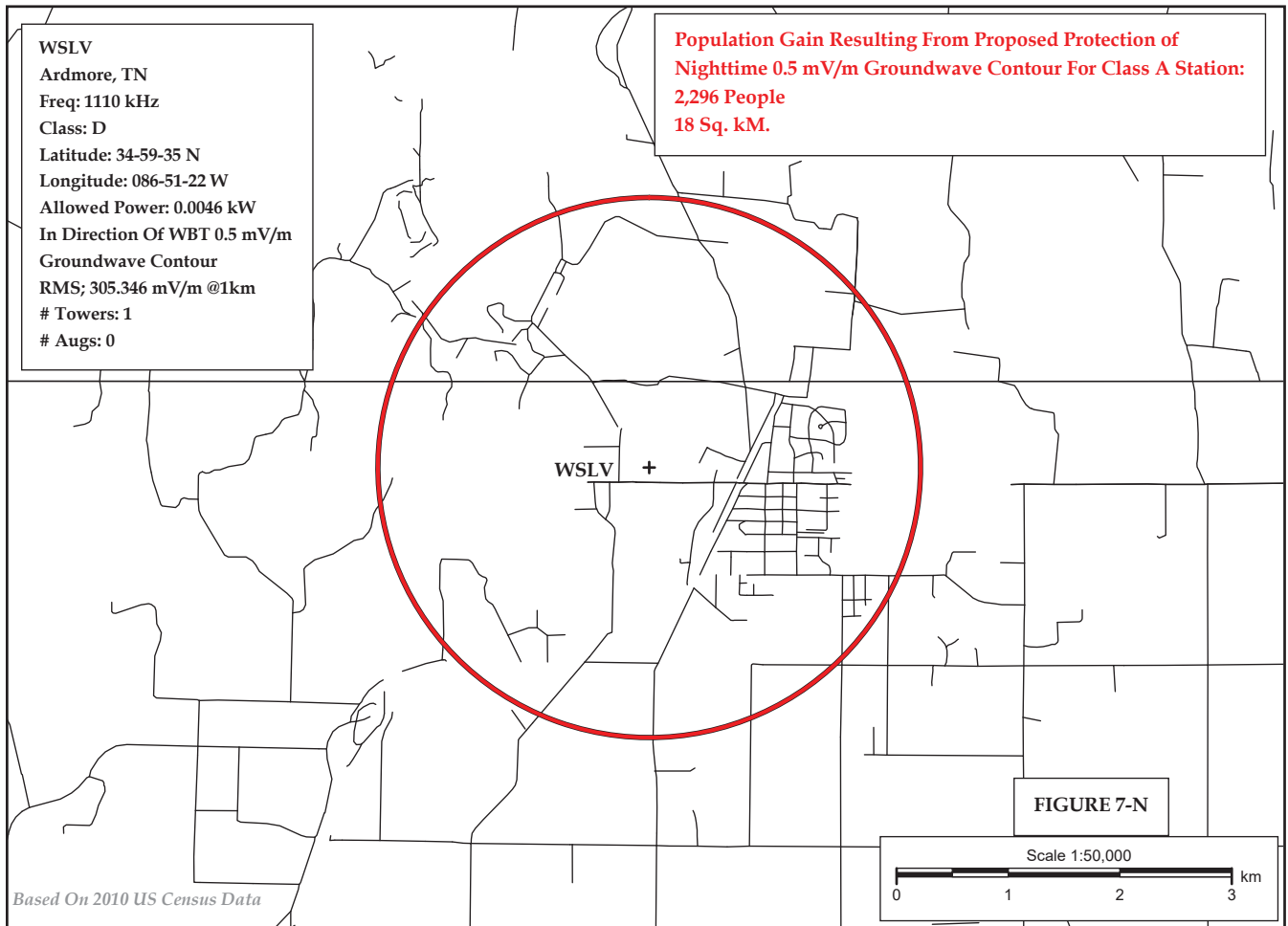
WCBR NIF 7.9 mV/m Groundwave Contour With Protection To Class A Station WBT's Proposed Protected 0.5 mV/m Groundwave Nighttime Contour



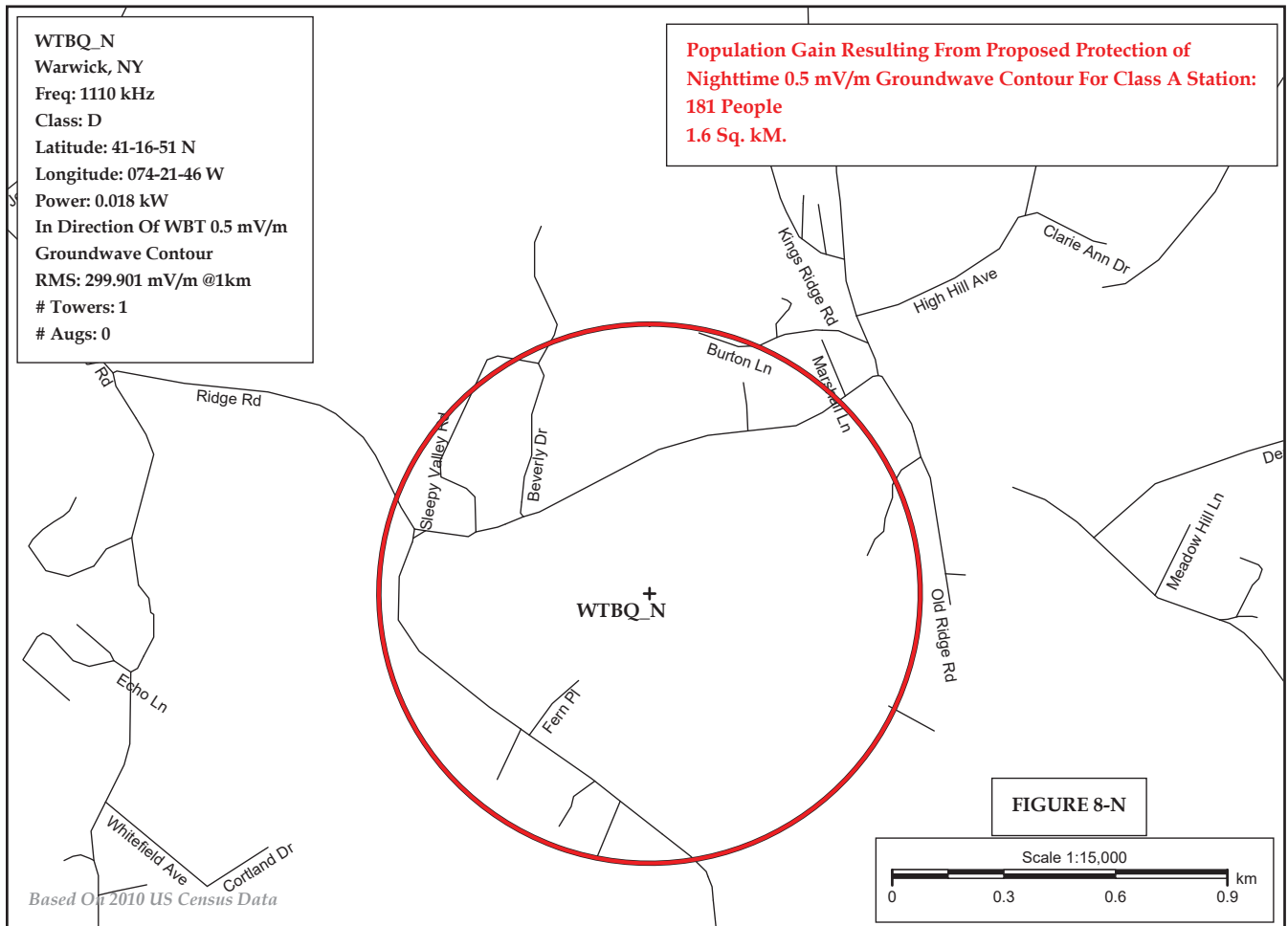
WKQA NIF 98 mV/m Groundwave Contour With Protection To Class A Station WBT's Proposed Protected 0.5 mV/m Groundwave Nighttime Contour



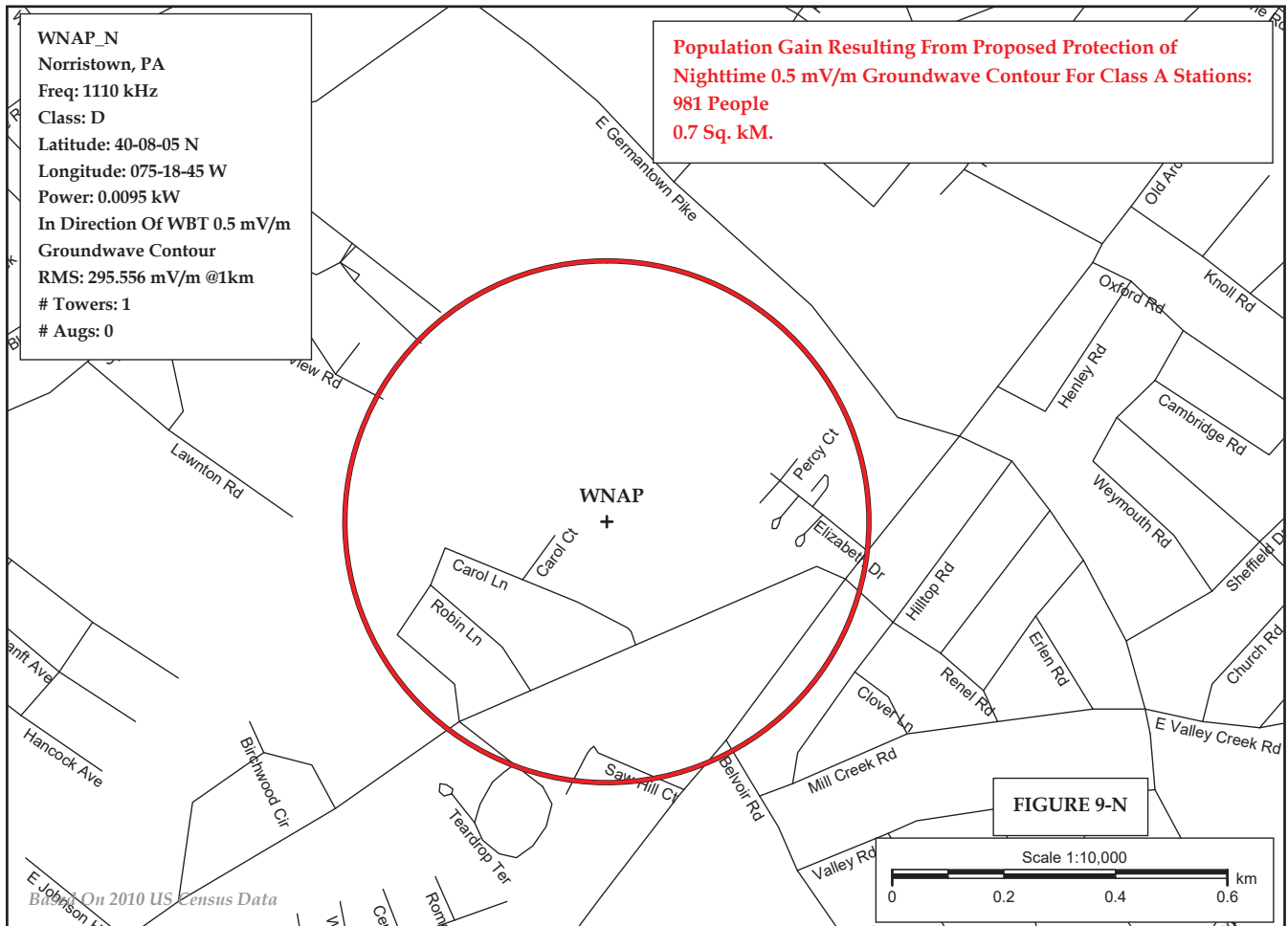
WTIS NIF 54 mV/m Groundwave Contour With Protection To Class A Station WBT's Proposed Protected 0.5 mV/m Groundwave Nighttime Contour



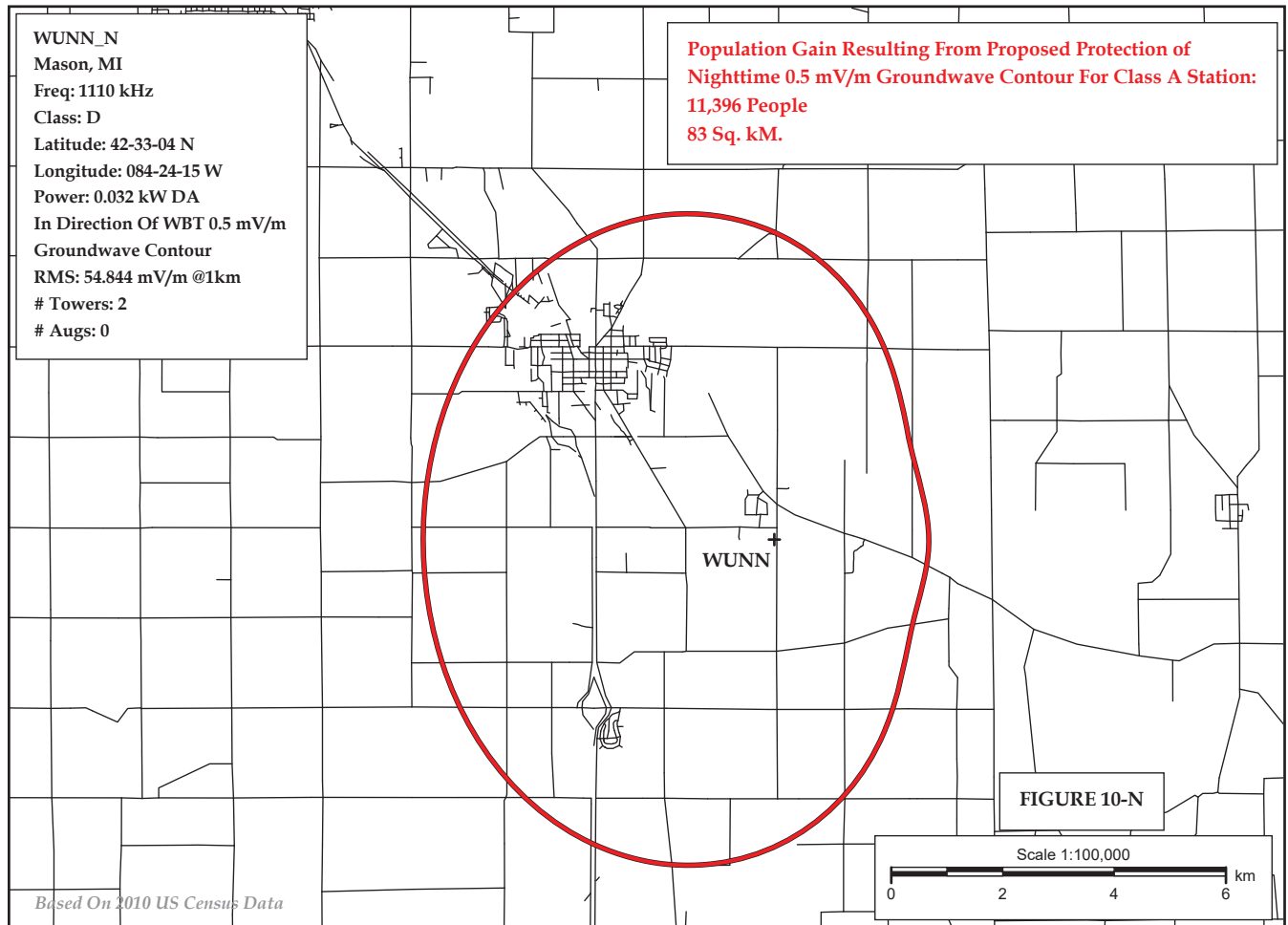
WSLV NIF 6.2 mV/m Groundwave Contour With Protection To Class A Station WBT's Proposed Protected 0.5 mV/m Groundwave Nighttime Contour



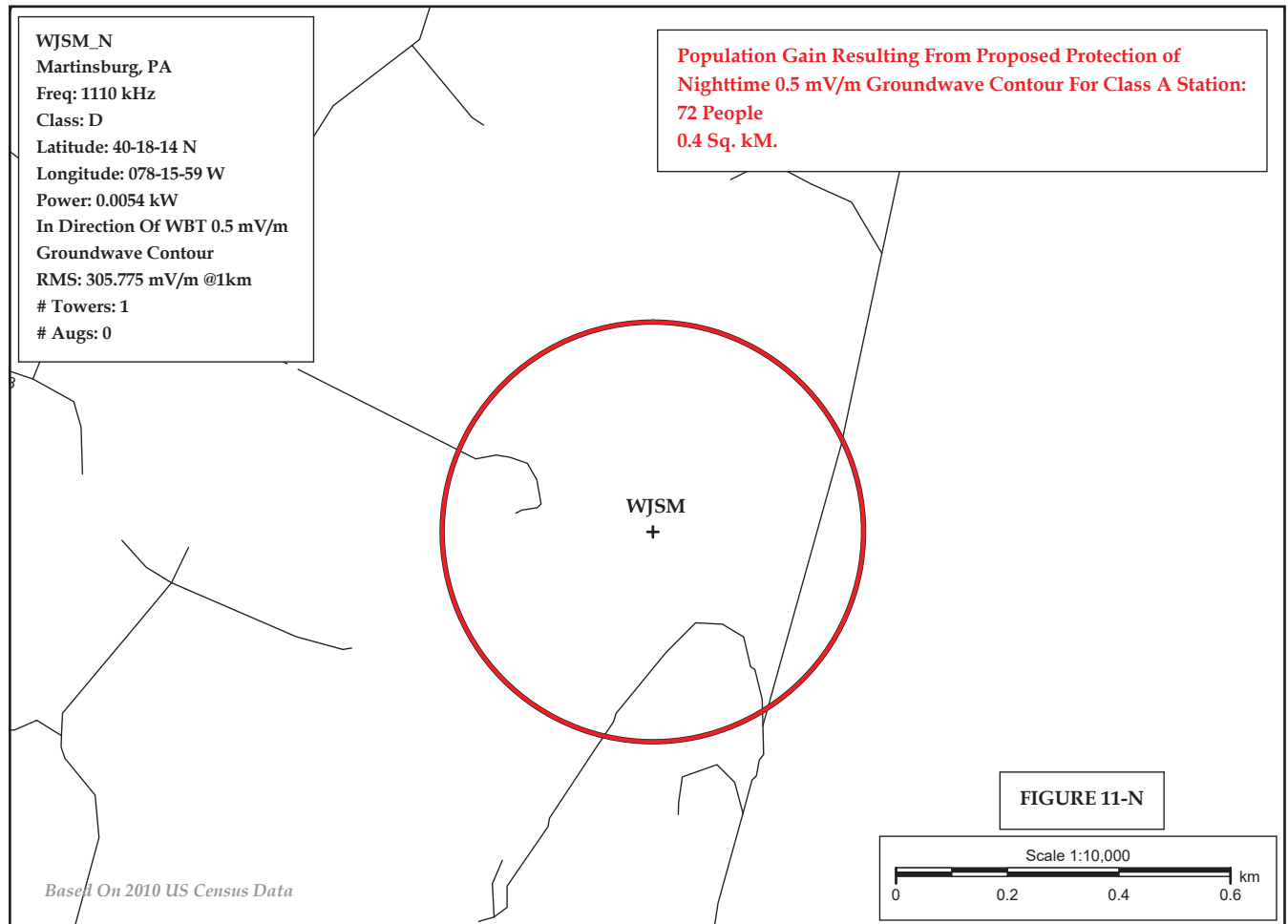
WTBQ NIF 41.5 mV/m Groundwave Contour With Protection To Class A Station WBT's Proposed Protected 0.5 mV/m Groundwave Nighttime Contour



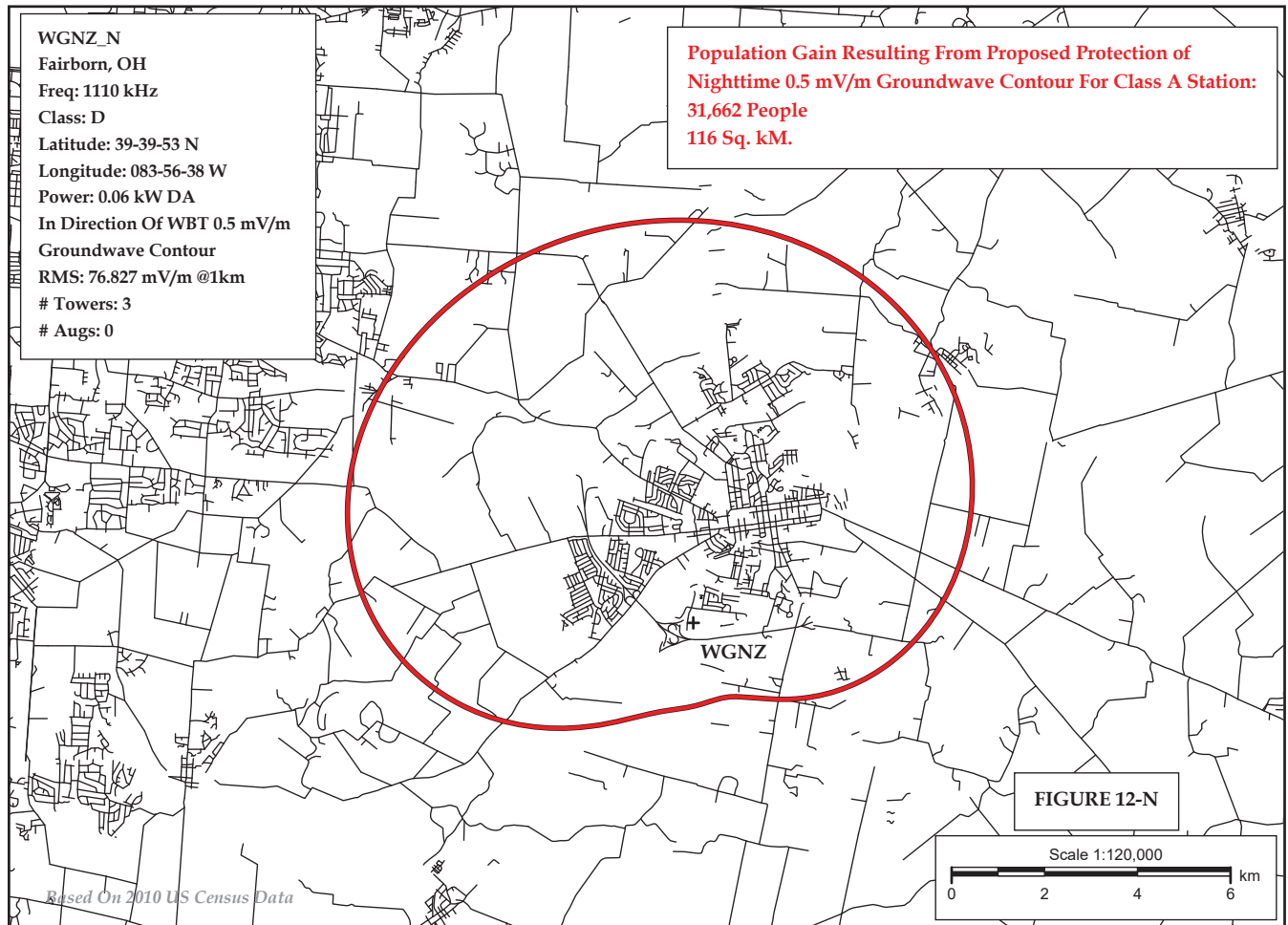
WNAP NIF 55.8 mV/m Groundwave Contour With Protection To Class A Station WBT's Proposed Protected 0.5 mV/m Groundwave Nighttime Contour



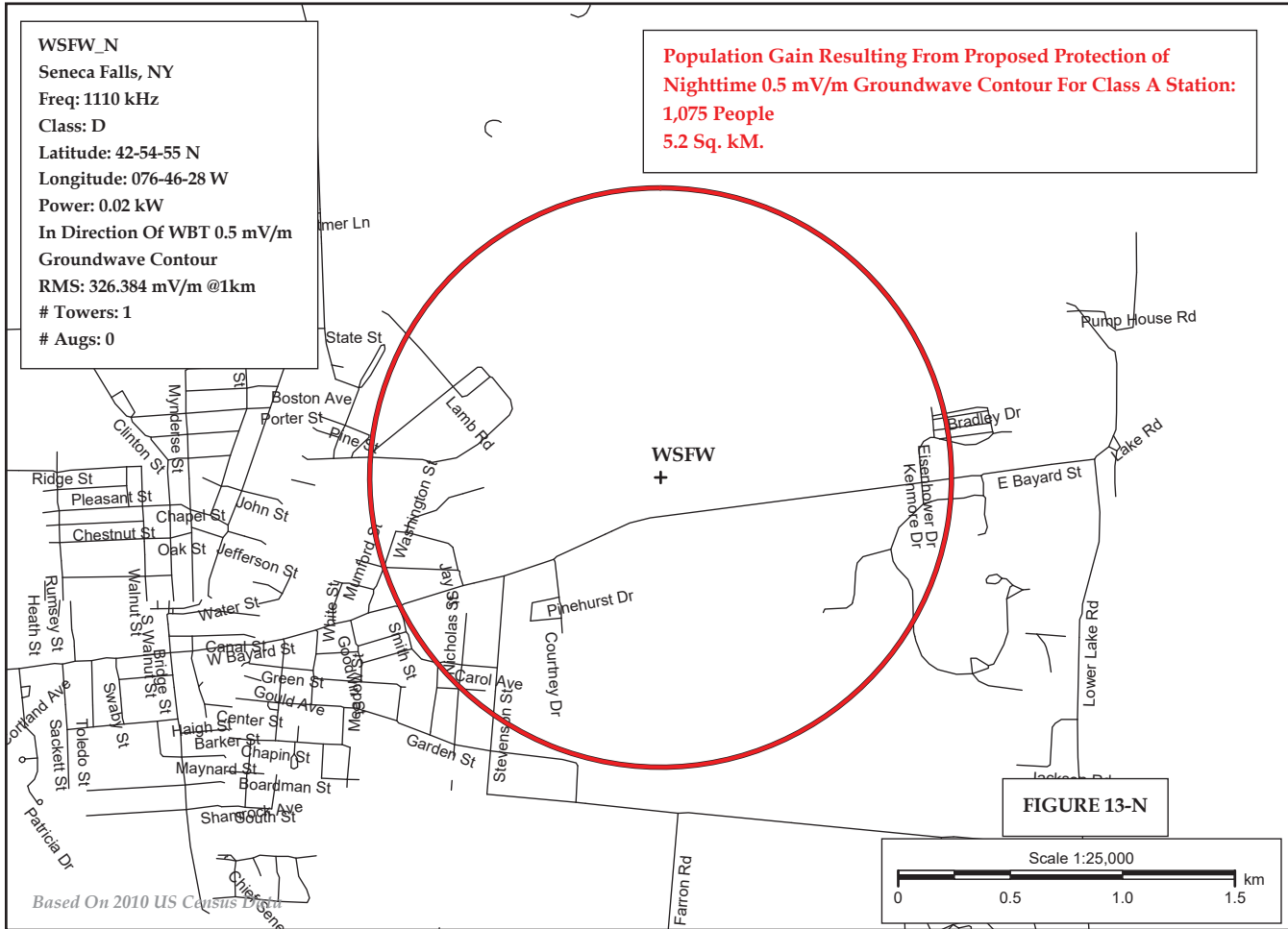
WUNN NIF 8.4 mV/m Groundwave Contour With Protection To Class A Station WBT's Proposed Protected 0.5 mV/m Groundwave Nighttime Contour



WJSM NIF 54.7 mV/m Groundwave Contour With Protection To Class A Station WBT's Proposed Protected 0.5 mV/m Groundwave Nighttime Contour

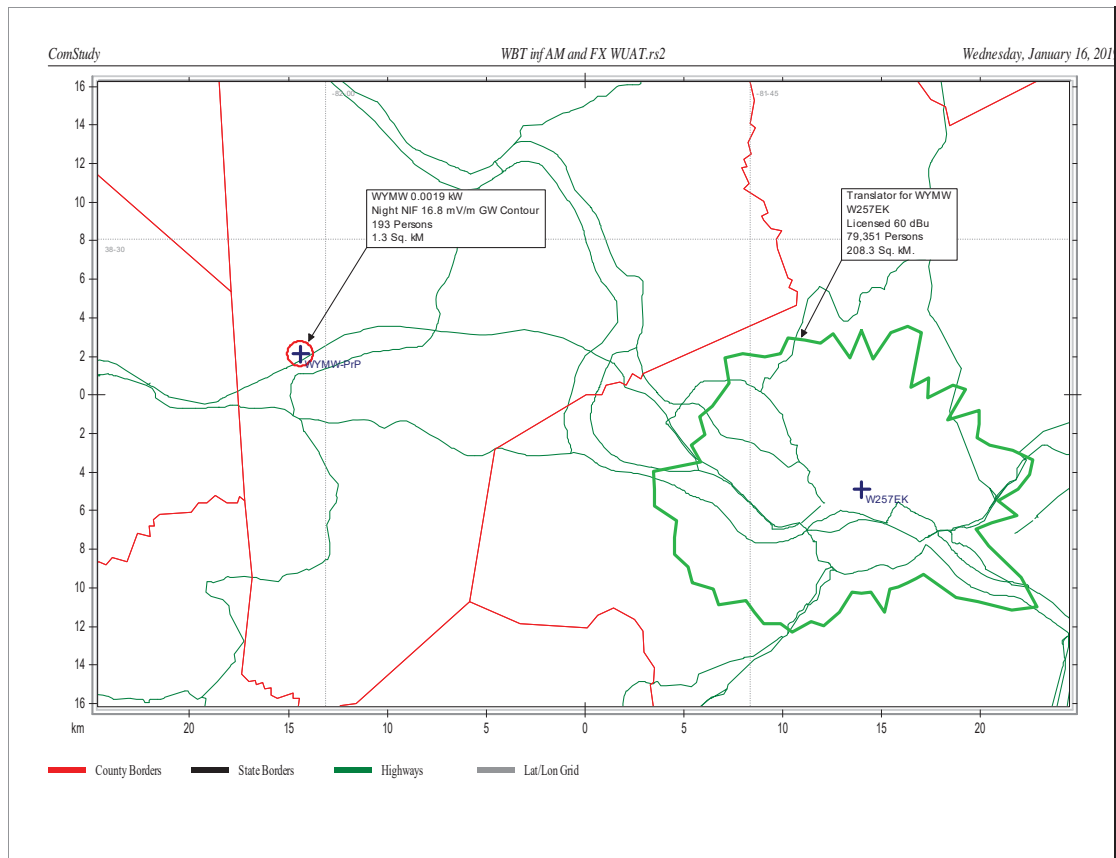


WGNZ NIF 9.1 mV/m Groundwave Contour With Protection To Class A Station WBT's Proposed Protected 0.5 mV/m Groundwave Nighttime Contour

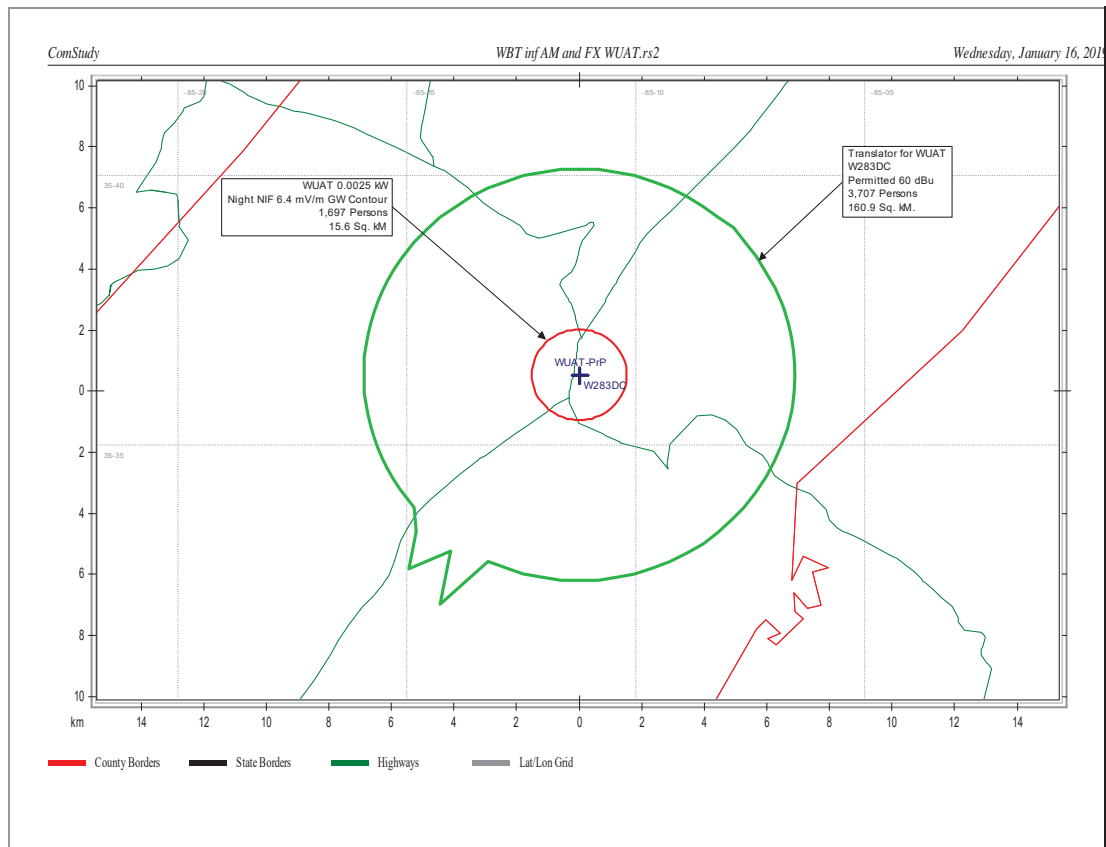


WSFW NIF 29.2 mV/m Groundwave Contour With Protection To Class A Station WBT's Proposed Protected 0.5 mV/m Groundwave Nighttime Contour

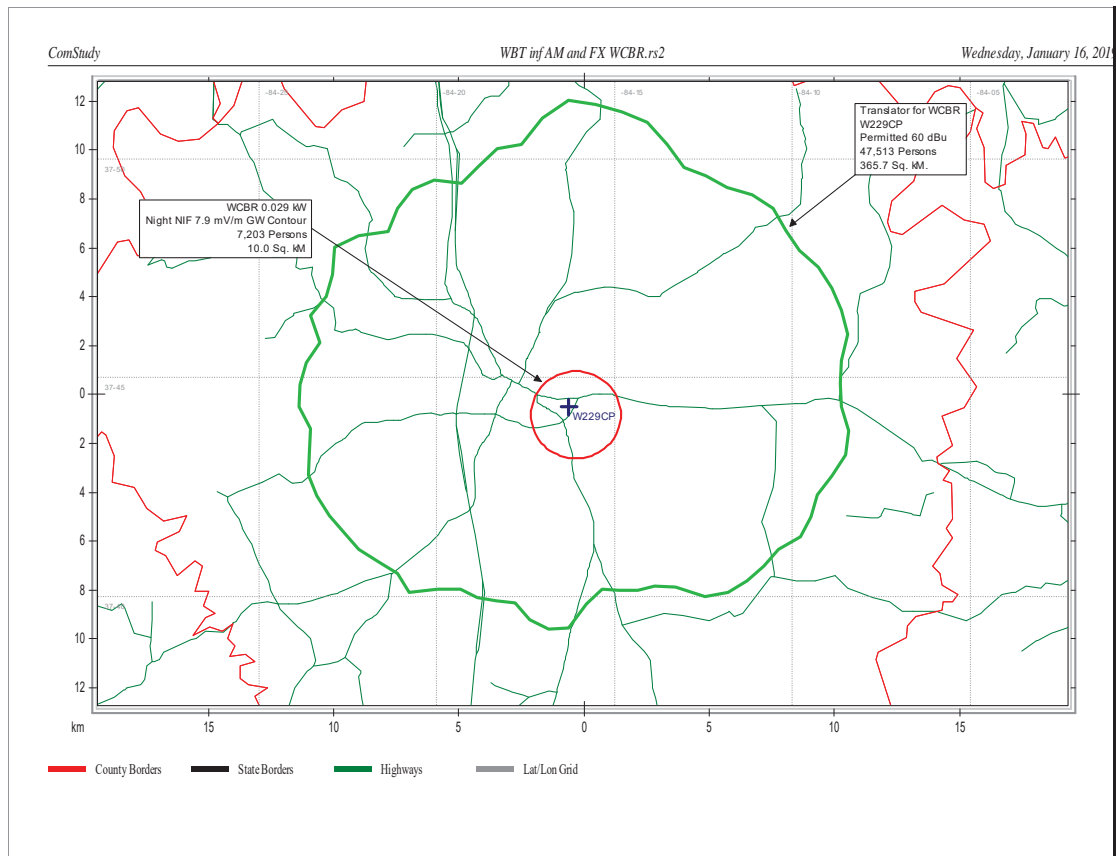
WYMW



WUAT



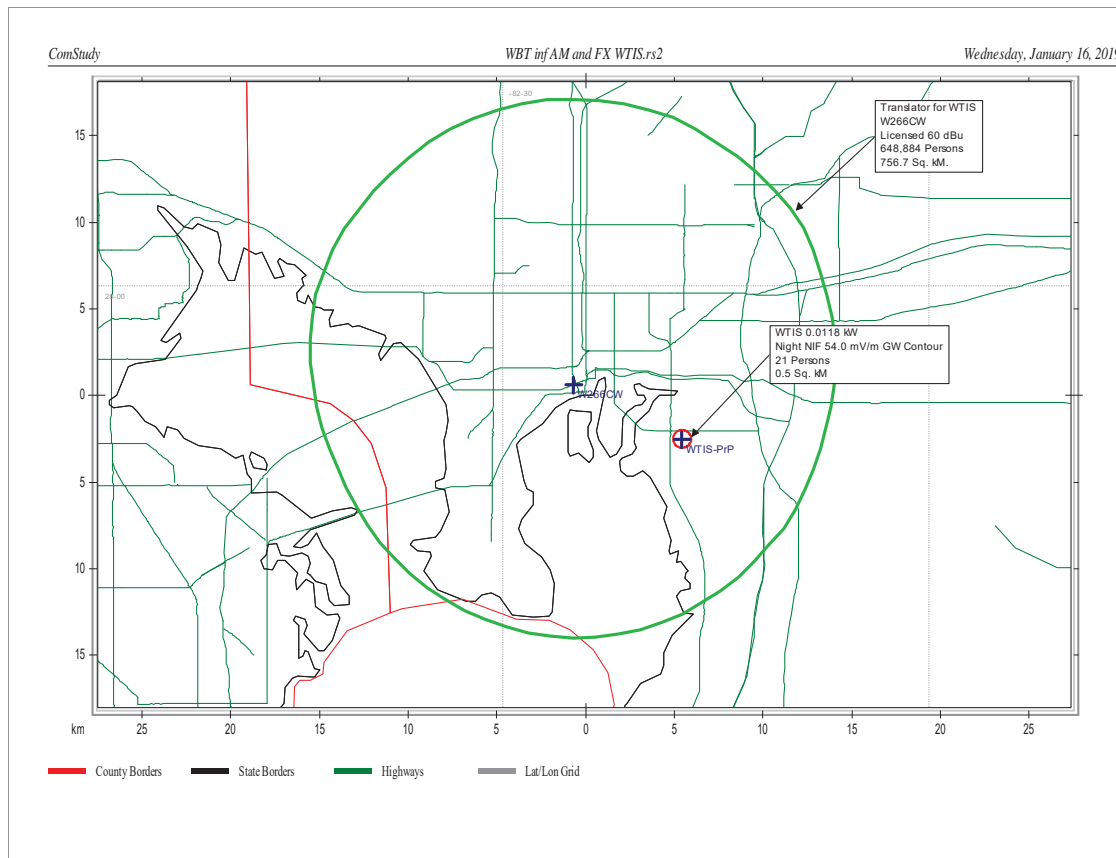
WCBR



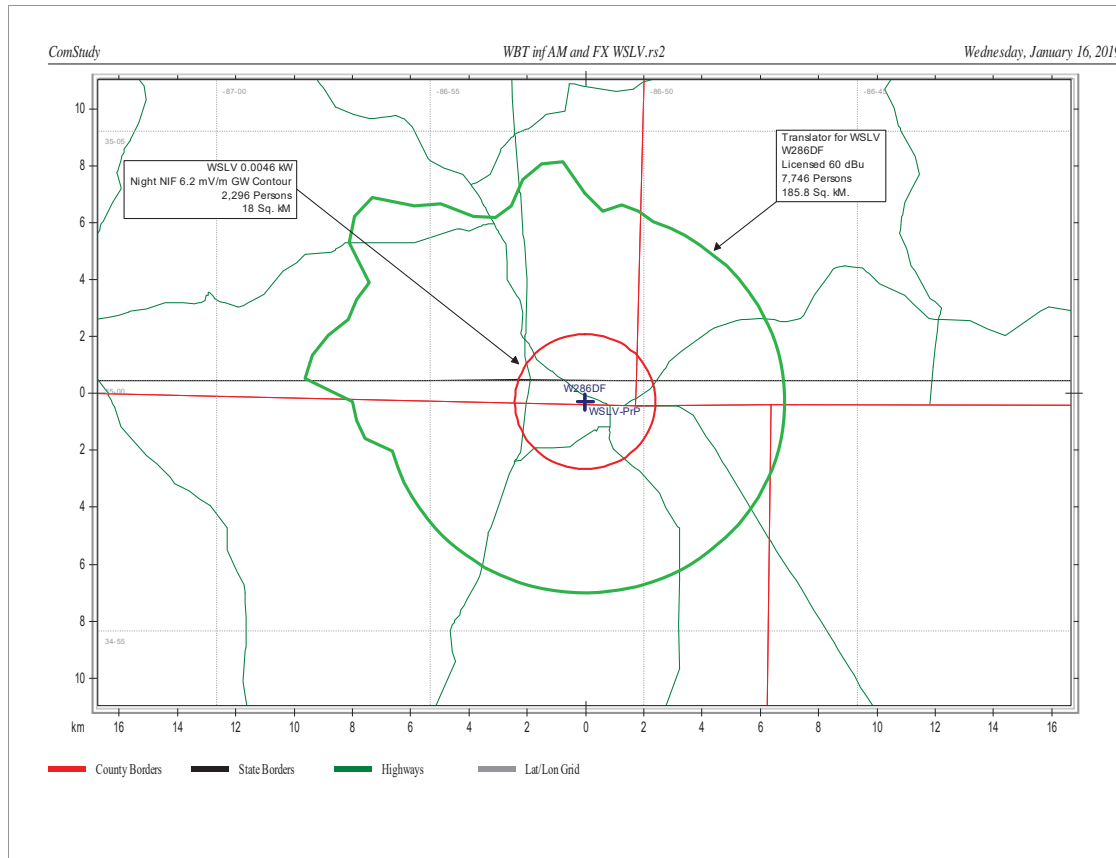
WKQA

No FM Translator

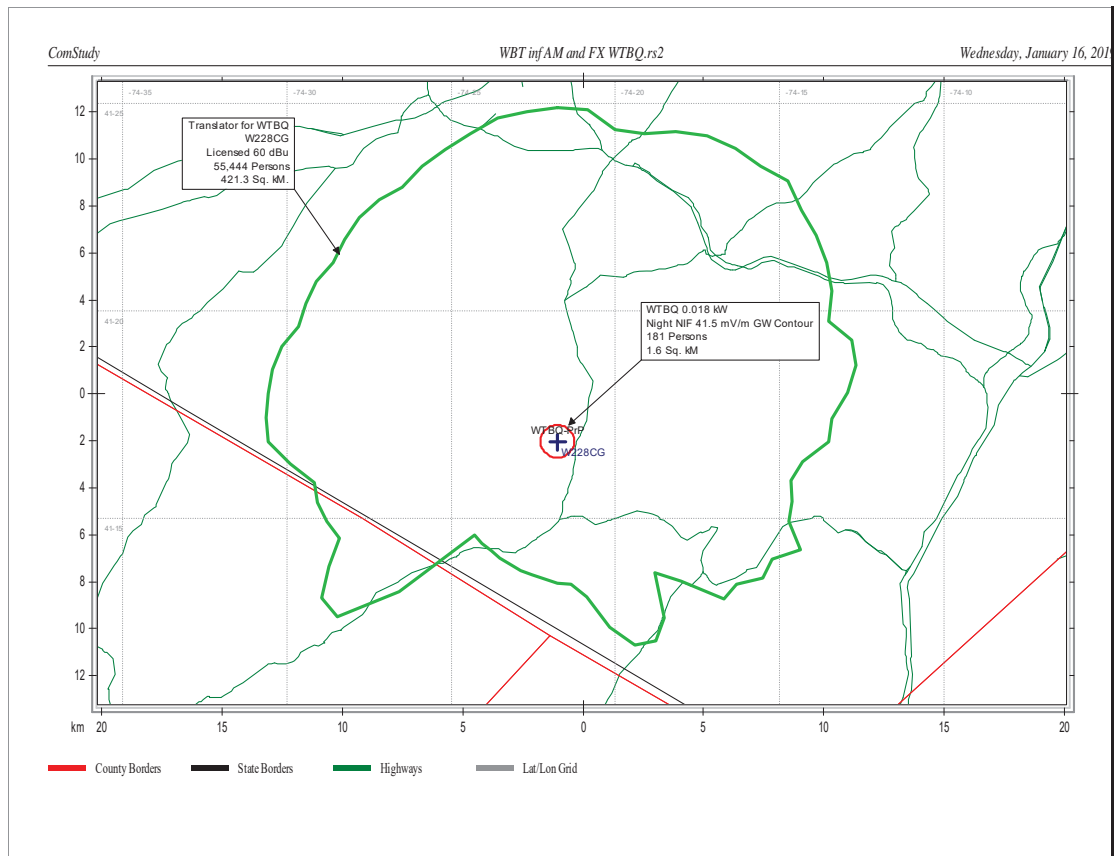
WTIS



WSLV



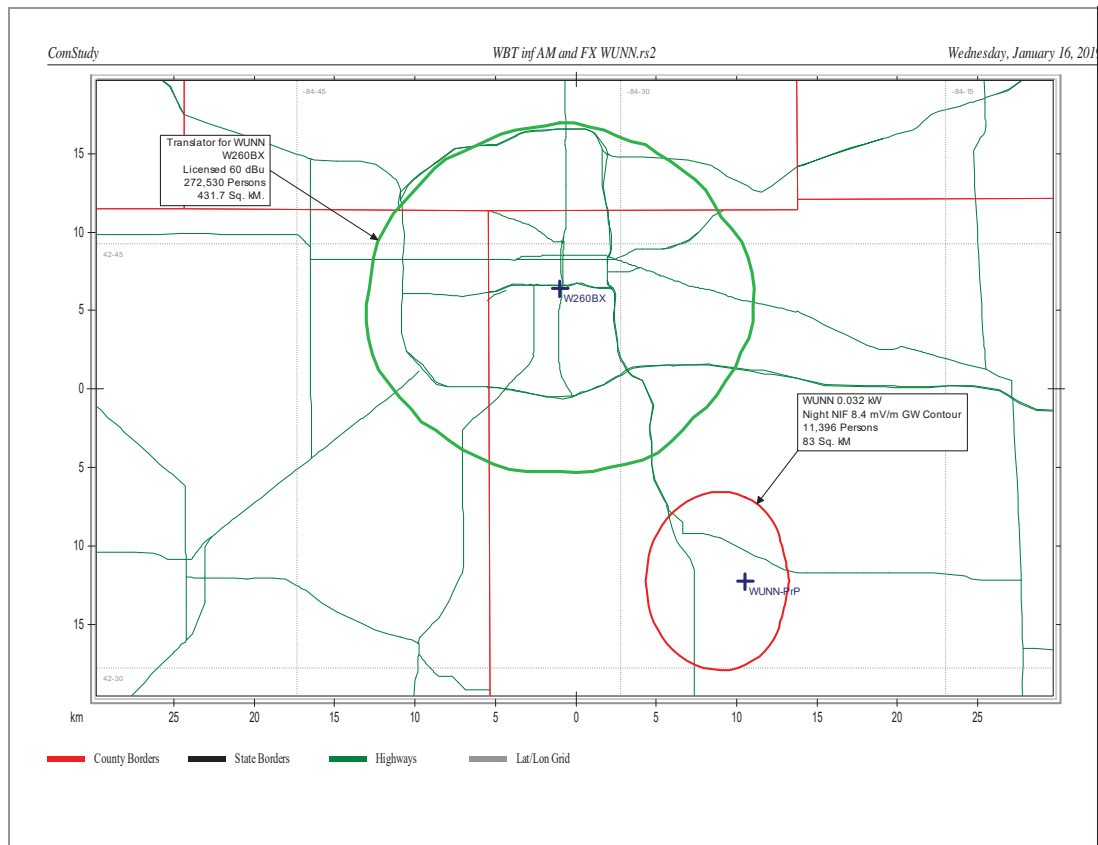
WTBQ



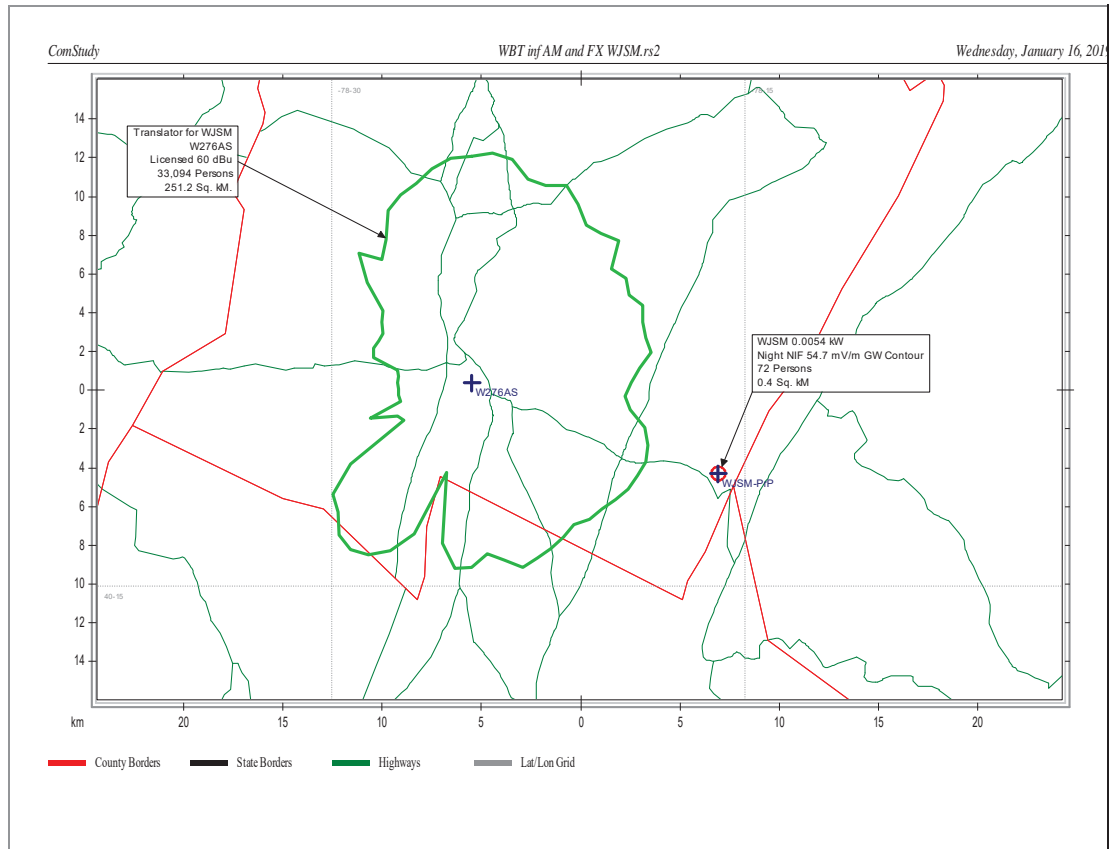
WNAP

No FM Translator

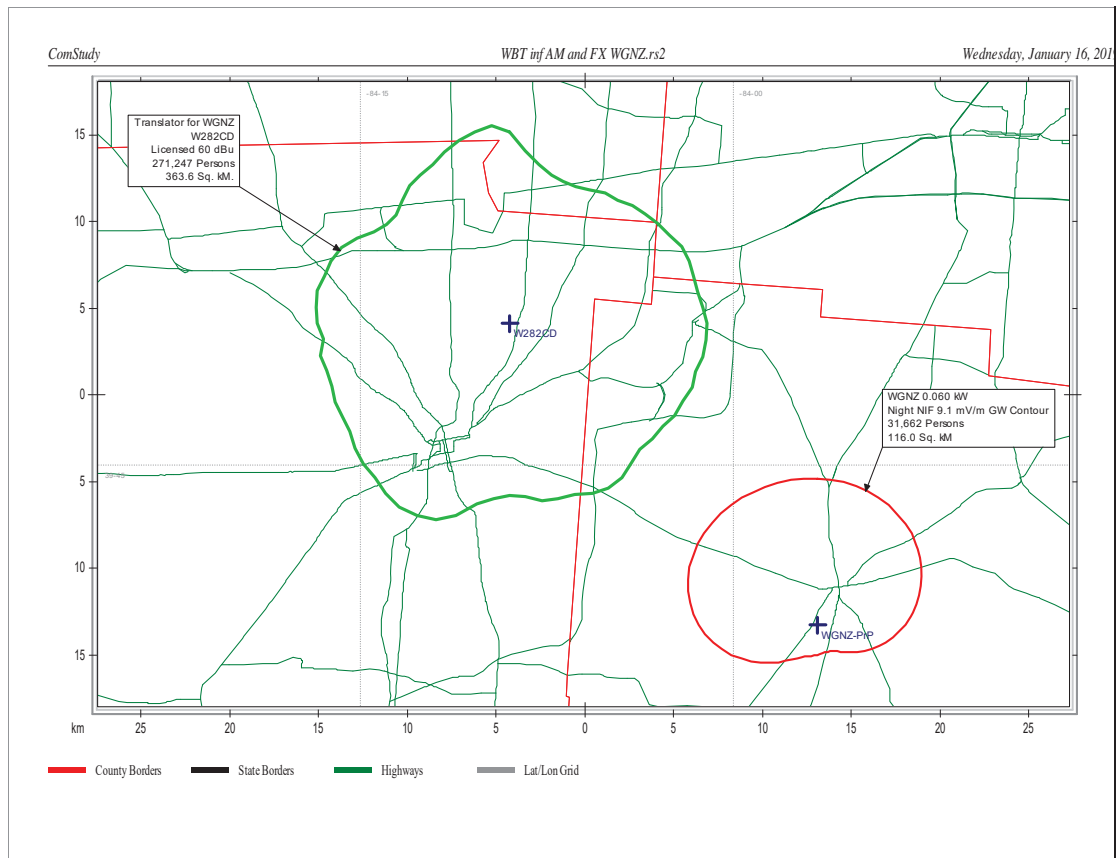
WUNN



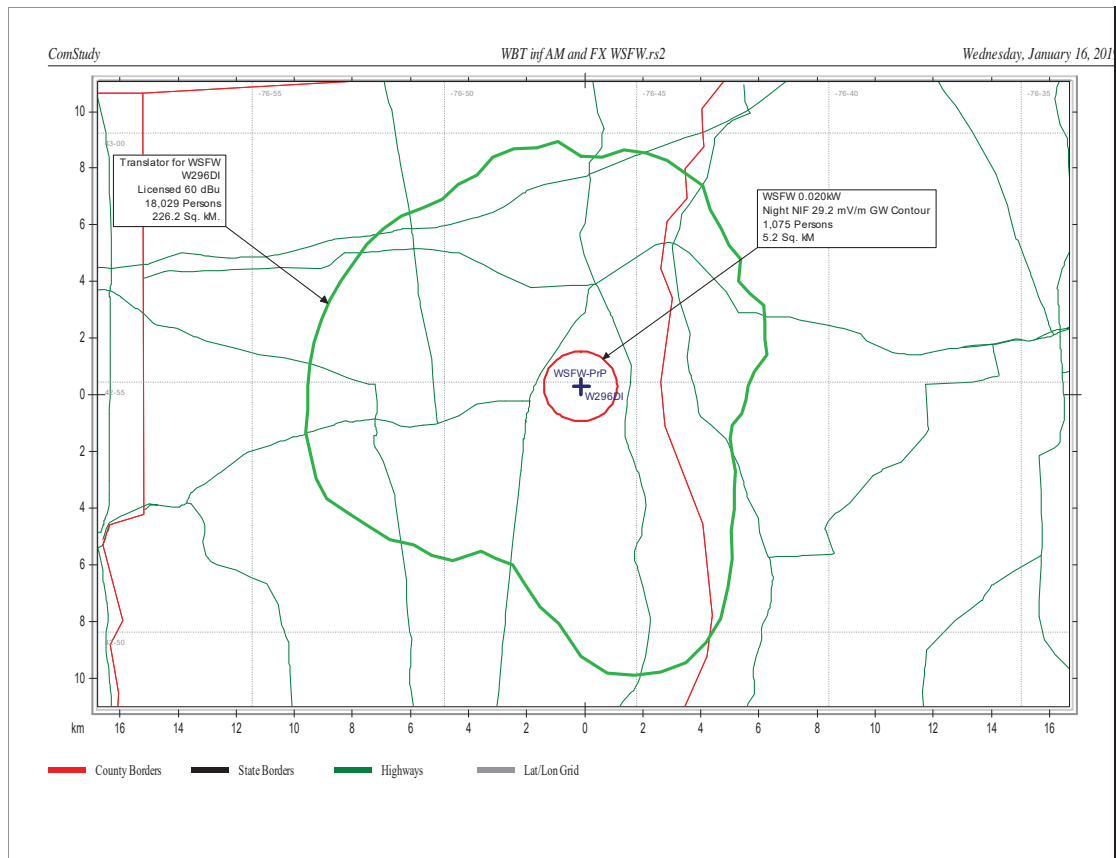
WJSM



WGNZ

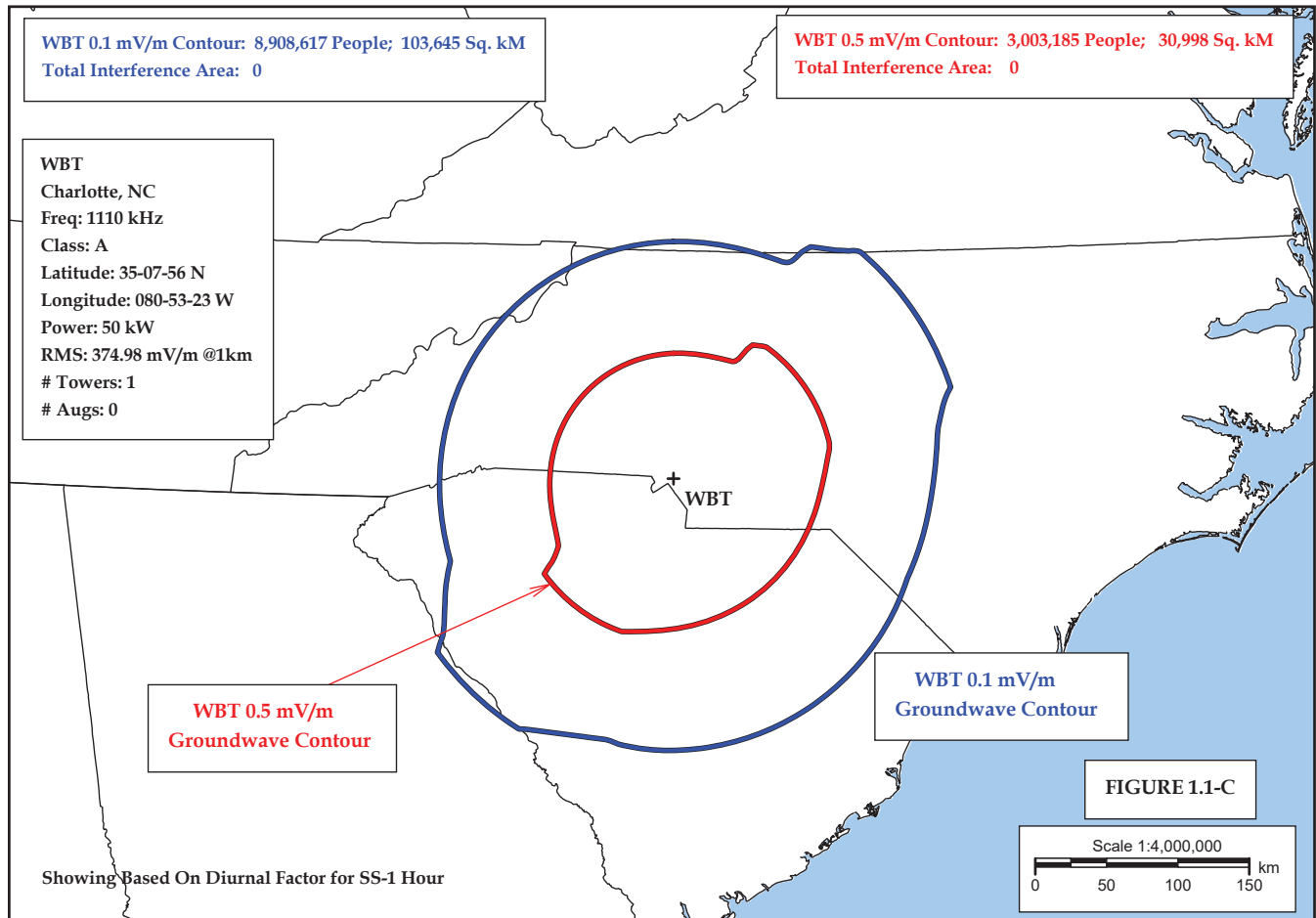


WSFW

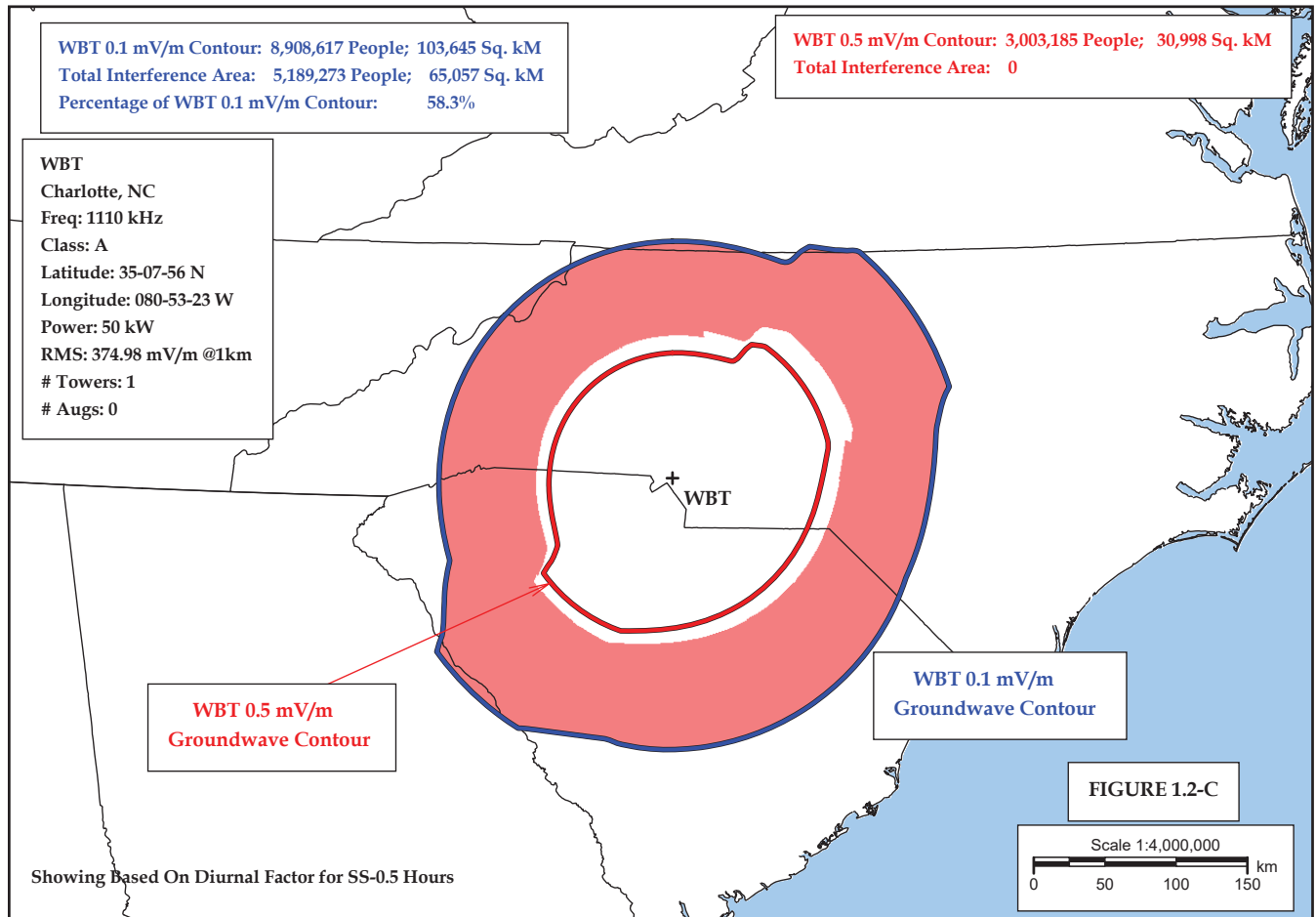


Summary of FM Translator Studies/WBT

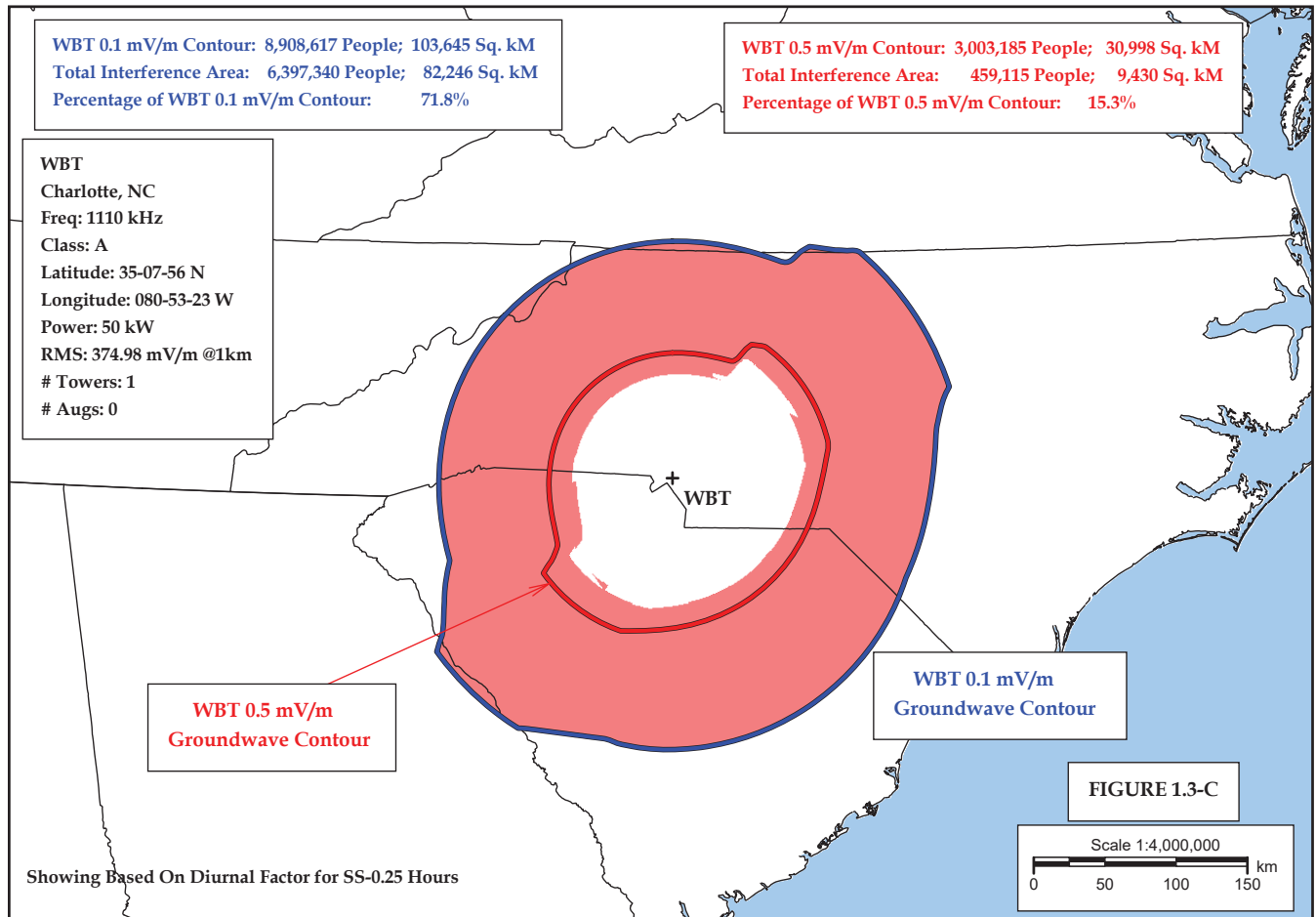
Class D AM Station Causing Interference to Class A Station WBT if Class D Operates with Maximum Power Per Nighttime Alternative 1	FM Translator (License or Permit) Associated with Class D Station	Population Within FM Translator's 60 dBu Contour	Population Within Class D Station's Potential Nighttime Interference Free Contour Under Nighttime Alternative 1
WYMW	W257EK	79,351	193
WUAT	W283DC	3,707	1,697
WCBR	W229CP	47,513	7,203
WKQA	N/A	N/A	1,232
WTIS	W266CW	648,884	21
WSLV	W286DF	7,746	2,296
WTBQ	W228CG	55,444	181
WNAP	N/A	N/A	981
WUNN	W260BX	272,530	11,396
WJSM	W276AS	33,094	72
WGNZ	W282CD	271,247	31,662
WSFW	W296DI	18,029	1,075
Cumulative Sum:		1,437,545	58,009



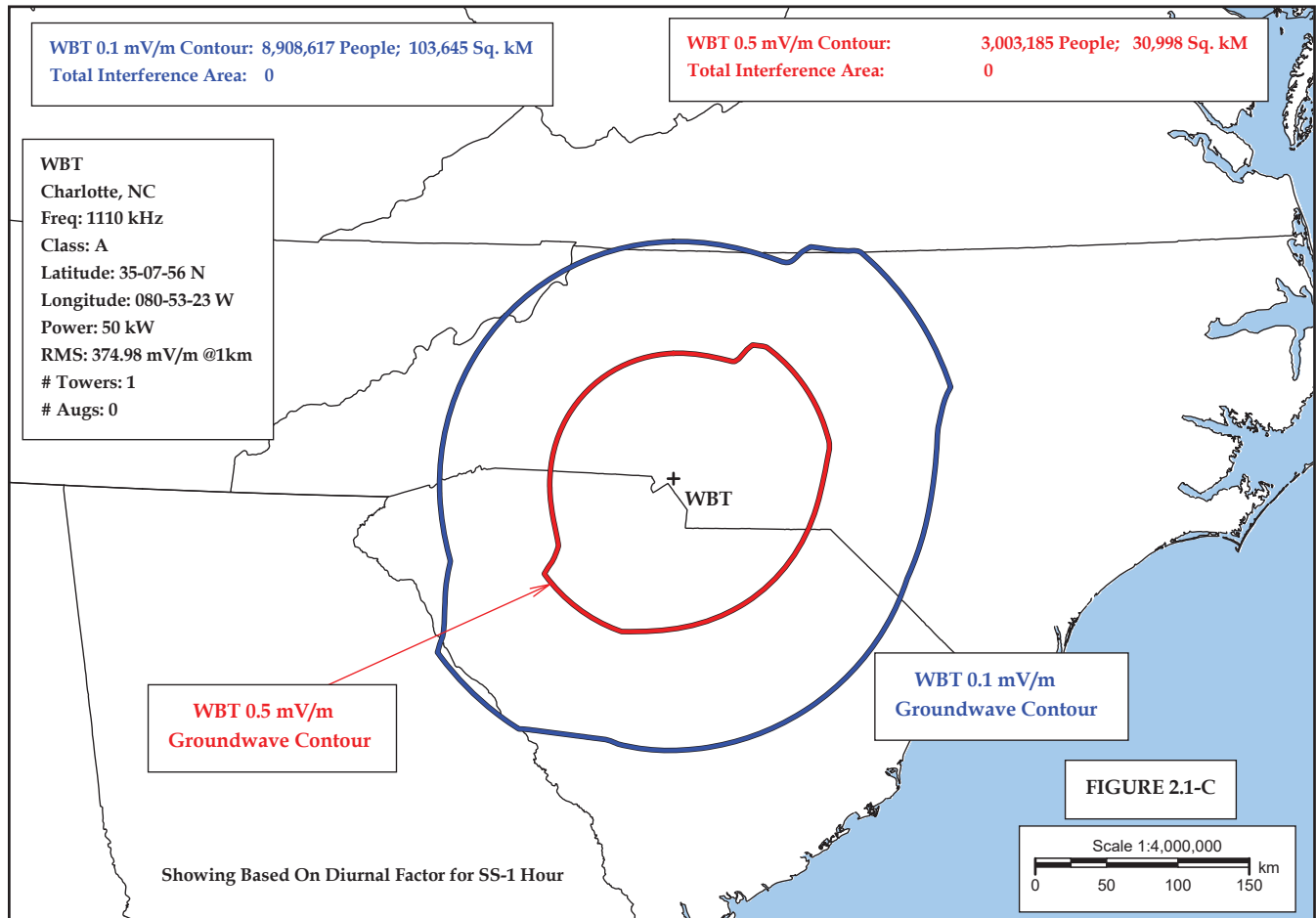
Alternative 1 - Proposed Critical Hours Interference Area to WBT From The Licensed Daytime Hours Operation Of Stations WGNZ, KFGL, WSLV, WTOF, WNAP, And WTIS To Class A Station WBT, Charlotte, NC for One Hour Before Sunset



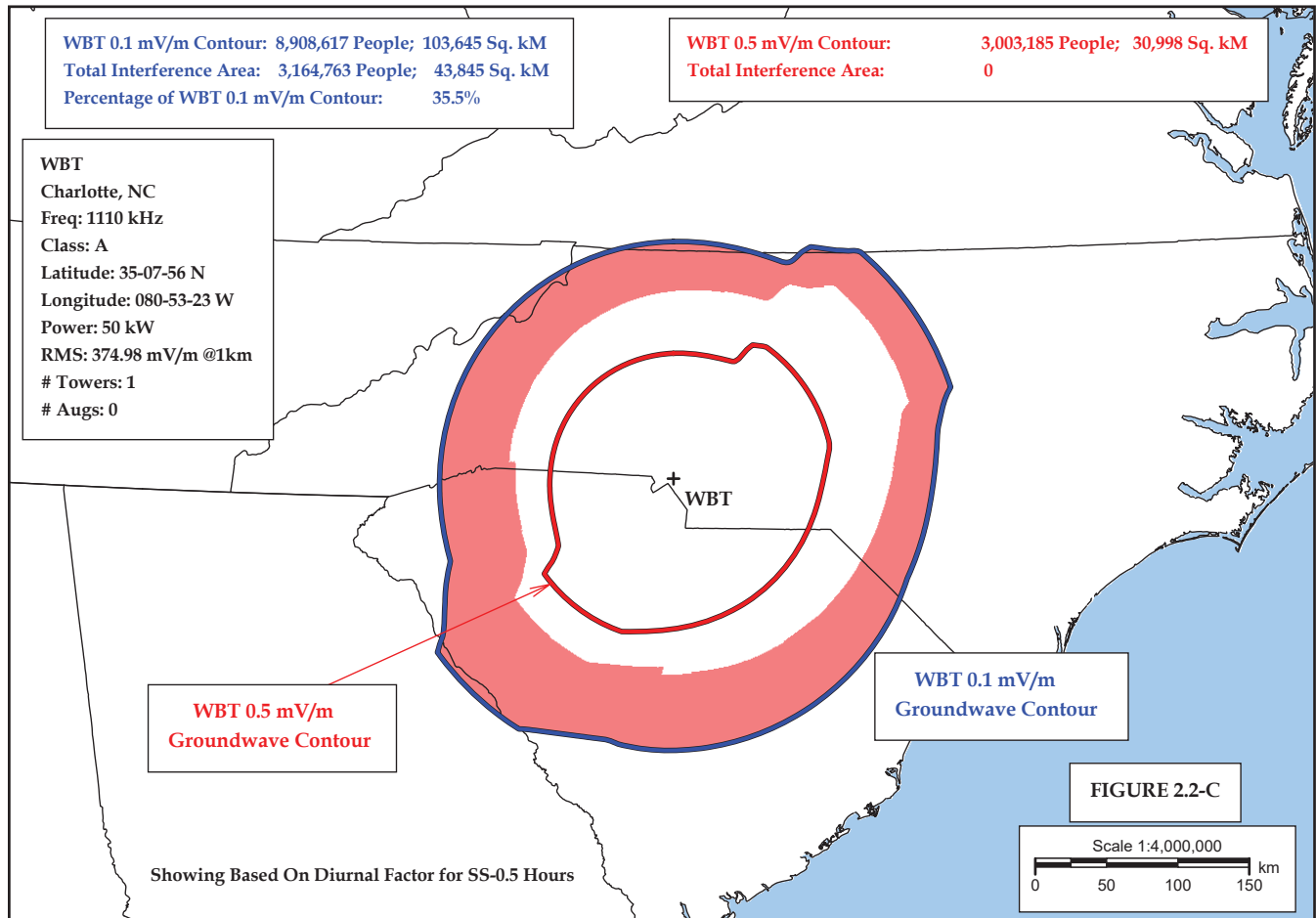
Alternative 1 - Proposed Critical Hours Interference Area to WBT From The Licensed Daytime Hours Operation Of Stations WGNZ, KFGL, WSLV, WTOF, WNAP, And WTIS To Class A Station WBT, Charlotte, NC for One-Half Hour Before Sunset



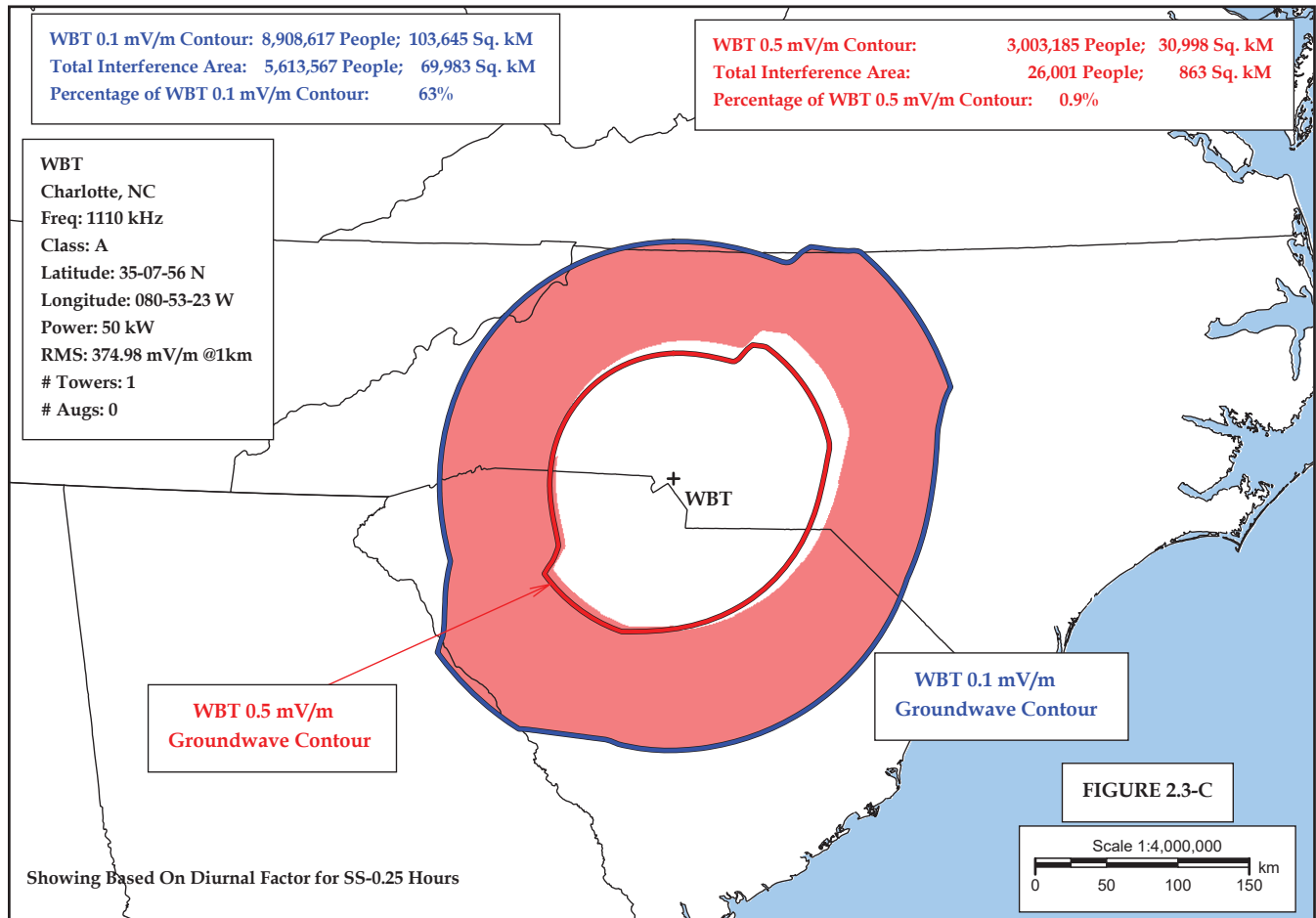
Alternative 1 - Proposed Critical Hours Interference Area to WBT From The Licensed Daytime Hours Operation Of Stations WGNZ, KEGL, WSLV, WTOF, WNAP, And WTIS To Class A Station WBT, Charlotte, NC for One-Quarter Hour Before Sunset



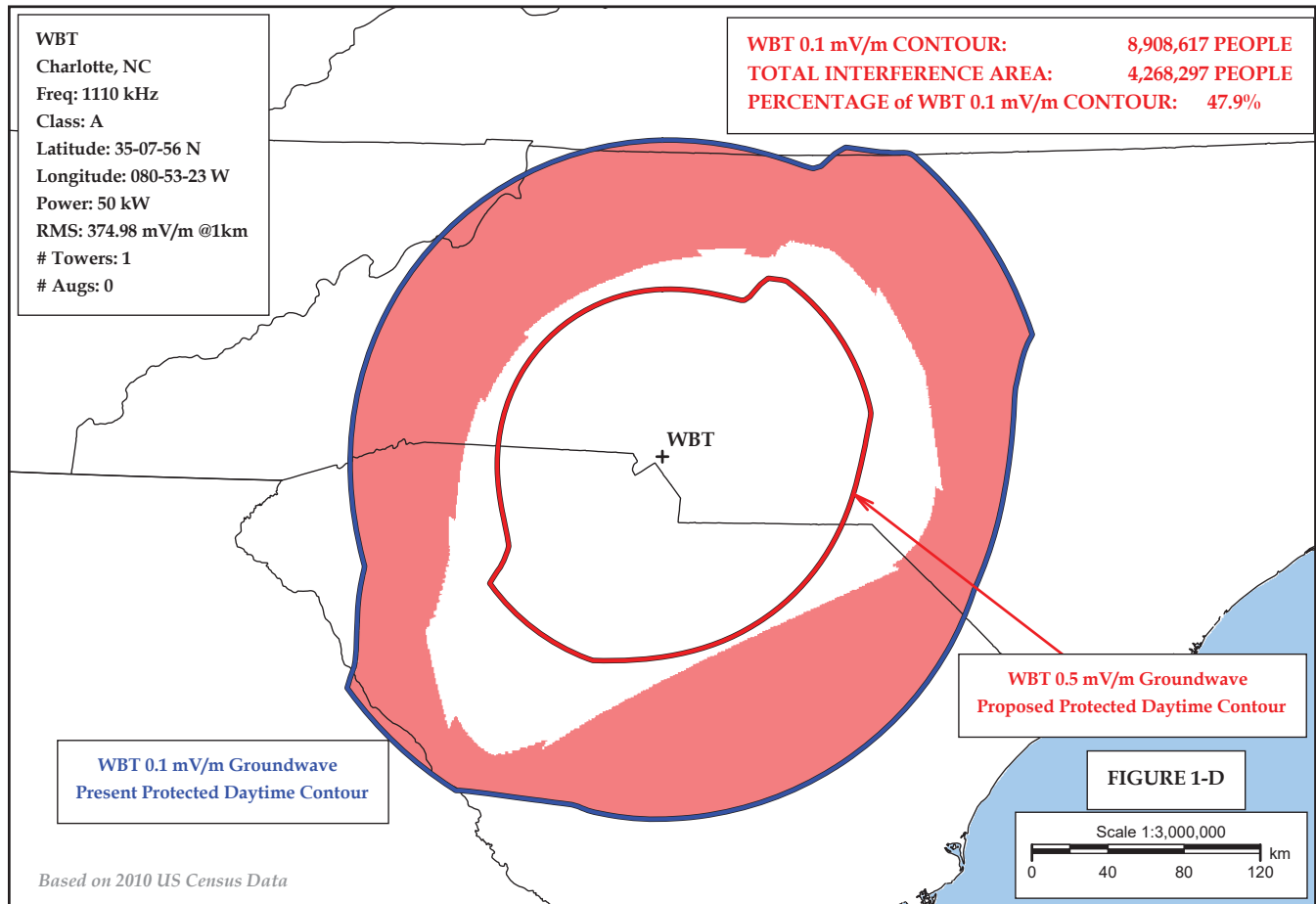
Alternative 2 - Proposed Critical Hours Interference Area to WBT From Potential Critical Hours Operation Of Stations WGNZ, KFGL, WSLV, WTOF, WNAP, And WTIS To Class A Station WBT, Charlotte, NC for One Hour Before Sunset



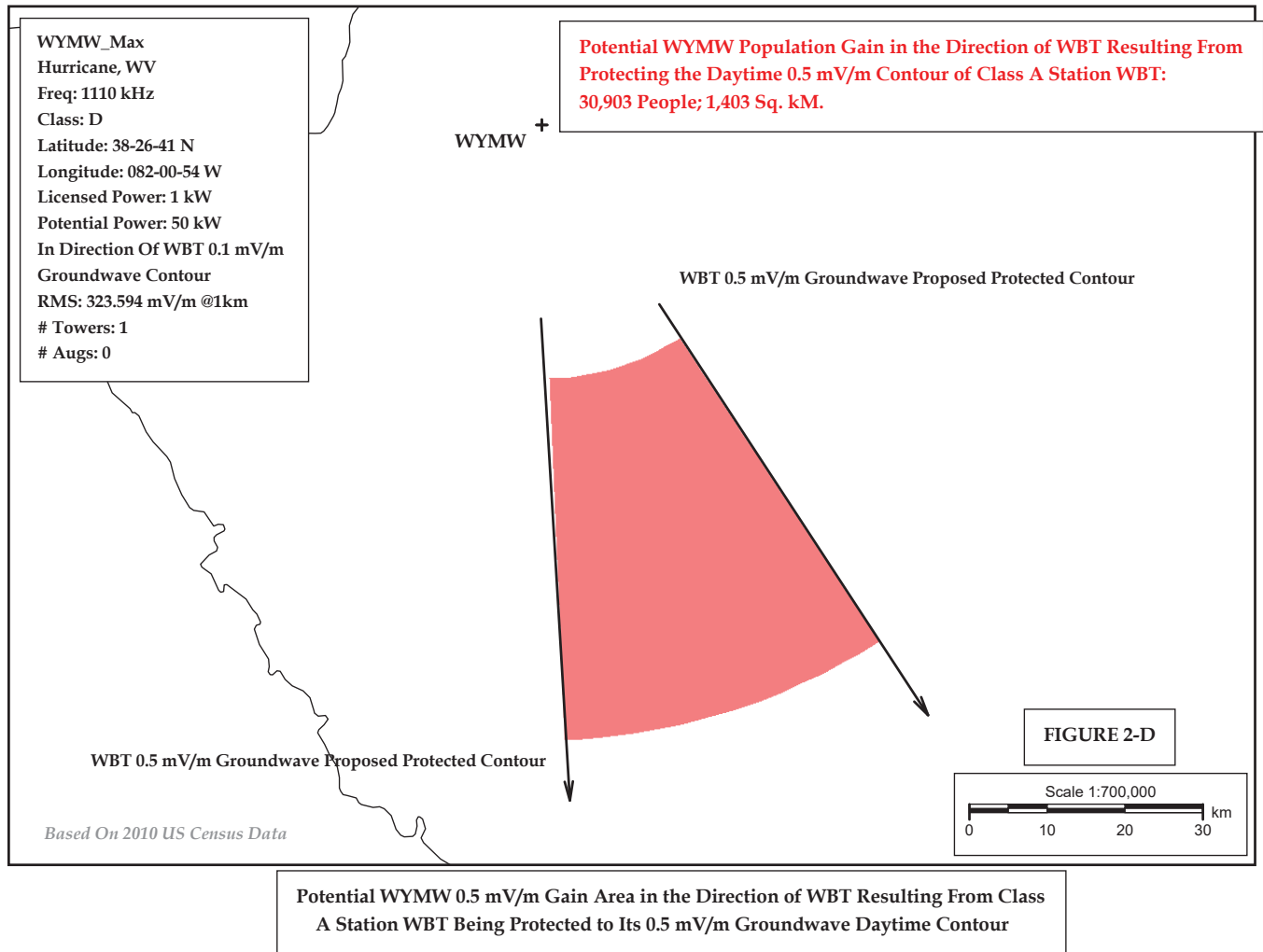
Alternative 2 - Proposed Critical Hours Interference Area to WBT From Potential Critical Hours Operation Of Stations WGNZ, KFGL, WSLV, WTOF, WNAP, And WTIS To Class A Station WBT, Charlotte, NC for One-Half Hour Before Sunset



Alternative 2 - Proposed Critical Hours Interference Area to WBT From Potential Critical Hours Operation Of Stations WGNZ, KFGL, WSLV, WTOF, WNAP, And WTIS To Class A Station WBT, Charlotte, NC for One-Quarter Hour Before Sunset



Red Shaded Area is Predicted Daytime Interference Area within WBT's 0.1 mV/m Contour From Nearby Class D Stations WYMW, WUAT, WCBR, WKQA and WEAJ Operating With Maximum Power in Direction of WBT



WUAT_Max
Pikesville, TN
Freq: 1110 kHz
Class: D
Latitude: 35-36-18 N
Longitude: 085-11-14 W
Licensed Power: 0.25 kW
Potential Power: 50 kW
In Direction Of WBT 0.1 mV/m
Groundwave Contour
RMS: 294.716 mV/m @1km
Towers: 1
Augs: 0

Potential WUAT Population Gain in the Direction of WBT Resulting From
Protecting the Daytime 0.5 mV/m Contour of Class A Station WBT:
67,120 People; 1,386 Sq. kM.

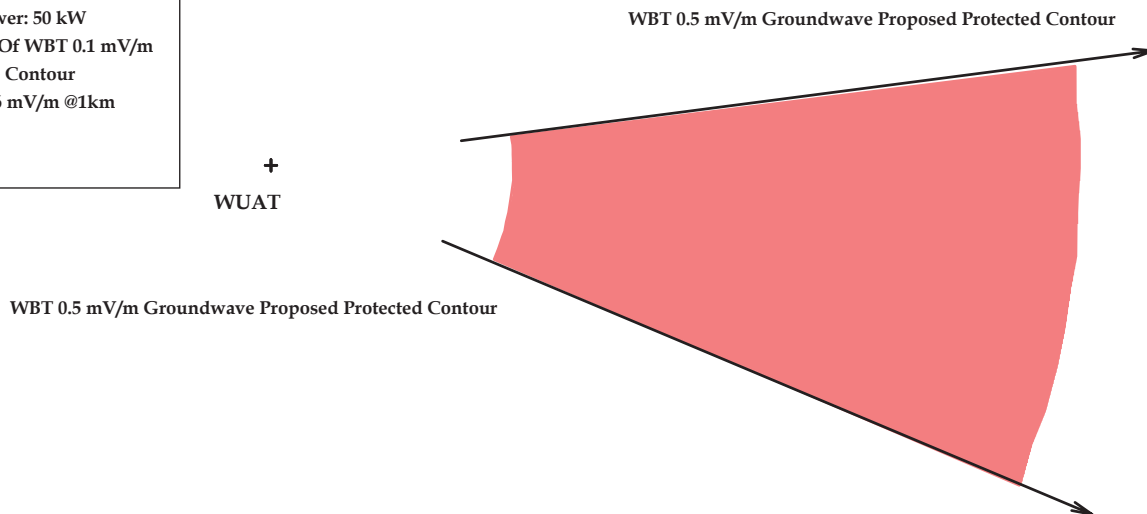
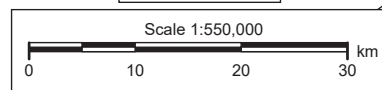


FIGURE 3-D



Based On 2010 US Census Data

Potential WUAT 0.5 mV/m Gain Area in the Direction of WBT Resulting From Class
A Station WBT Being Protected to Its 0.5 mV/m Groundwave Daytime Contour

WCBR_Max
Richmond, KY
Freq: 1110 kHz
Class: D
Latitude: 37-44-09 N
Longitude: 084-16-05 W
Licensed Power: 0.25 kW
Potential Power: 50 kW
In Direction Of WBT 0.1 mV/m
Groundwave Contour
RMS: 299.901 mV/m @1km
Towers: 1
Augs: 0

+ WCBR

Potential WCBR Population Gain in the Direction of WBT Resulting From
Protecting the Daytime 0.5 mV/m Contour of Class A Station WBT:
35,008 People; 2,239 Sq. kM.

WBT 0.5 mV/m Groundwave proposed Protected Contour

WBT 0.5 mV/m Groundwave Proposed Protected Contour

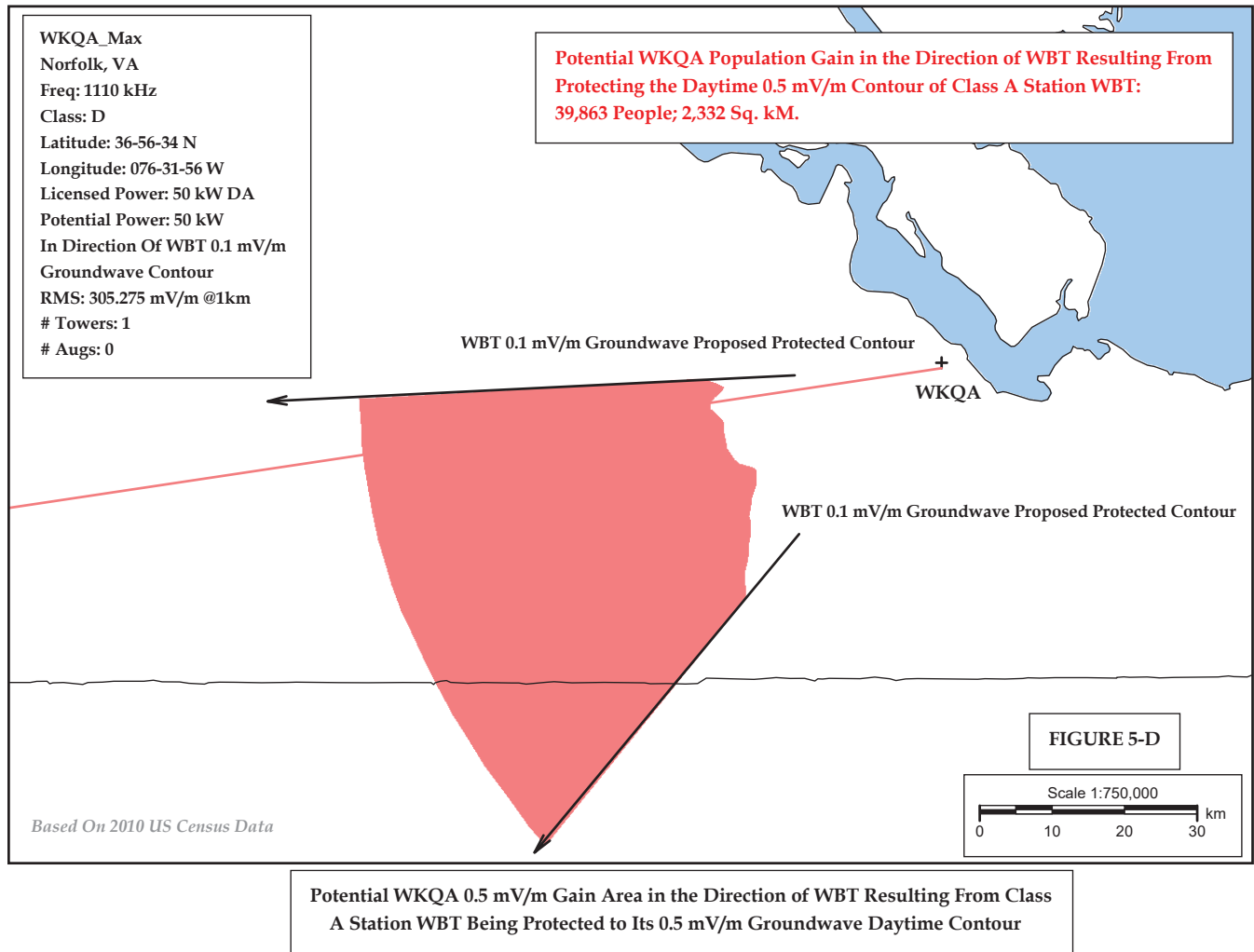
FIGURE 4-D

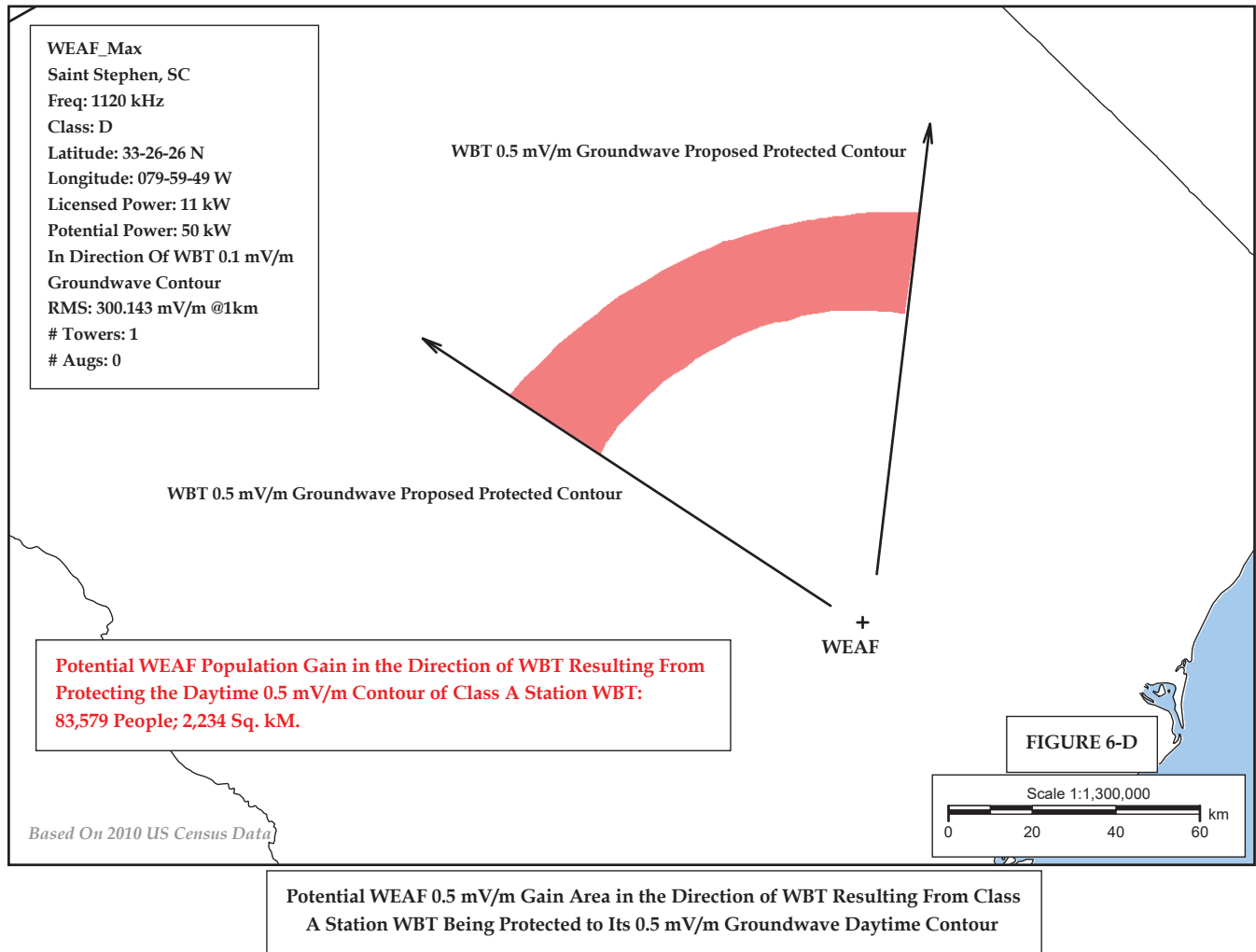
Scale 1:750,000

0 10 20 30 km

Based On 2010 US Census Data

Potential WCBR 0.5 mV/m Gain Area in the Direction of WBT Resulting From Class
A Station WBT Being Protected to Its 0.5 mV/m Groundwave Daytime Contour





WBT, CHARLOTTE, NORTH CAROLINA

1110 kHz 50 kW DA-N

JANUARY 2019

WBT NIGHTTIME OPERATION

0.5 mV/m 50% Skywave
(Presently Protected
Contour)
Current Population

Interference Caused to 0.5 mV/m 50% Skywave by
Maximized Class D Nighttime Operations Per *SFNPRM*
Nighttime Alternative 1
(Figure 1-N)

Population:

Percentage of Interference to
Population Within 0.5 mV/m
50% Skywave:

99,838,913

79,523,475

79.7%

**GAIN IN CLASS D STATION'S NIGHTTIME INTERFERENCE FREE CONTOUR SERVICE
WITH MAXIMUM POWER IN THE DIRECTION OF WBT (Figures 2-N through 13-N)**

Maximizing Class D Station	Gain by Population (Persons) and Area (square kilometers)	Figure
WYMW	193/1.3	2-N
WUAT	1,697/15.6	3-N
WCBR	7,203/10	4-N
WKQA	1,232/3.2	5-N
WTIS	21/0.5	6-N
WSLV	2,296/18	7-N
WTBQ	181/1.6	8-N
WNAP	981/0.7	9-N
WUNN	11,396/83	10-N
WJSM	72/0.4	11-N
WGNZ	31,662/116	12-N
WSFW	1,075/5.2	13-N
COLLECTIVE GAIN:	58,009/255.5	

NET LOSS IN SERVICE FROM *SFNPRM* NIGHTTIME ALTERNATIVE 1 (CLASS A
AM STATION LOSS MINUS COLLECTIVE GAIN IN CLASS D SERVICE):

79,523,475 (Loss of Class A AM Service) – 58,009 (Collective Class D Gain) = 79,465,466 persons Net
Loss

WBT, CHARLOTTE, NORTH CAROLINA

1110 kHz 50 kW DA-N

JANUARY 2019

WBT CRITICAL HOURS OPERATION

SENPRM Alternative 1: No Critical Hours Protections To Class A AM Stations

Critical Hours Time Period	Interference Caused Within Class A 0.1 mV/m Groundwave Contour By Class D Operations With Full Daytime Power			Interference Caused Within Class A 0.5 mV/m Groundwave Contour By Class D Operations With Full Daytime Power		
	Population:	Area (square kilometers):	Percentage of Interference to Population Within 0.1 mV/m Groundwave Contour:	Population:	Area (square kilometers):	Percentage of Interference to Population Within 0.5 mV/m Groundwave Contour:
One Hour Before Sunset (Figure 1.1-C)	0	0	0%	0	0	0%
One-Half Hour Before Sunset (Figure 1.2-C)	5,189,273	65,057	58.3%	0	0	0%
One-Quarter Hour Before Sunset (Figure 1.3-C)	6,397,340	82,246	71.8%	459,115	9,430	15.3%

WBT CRITICAL HOURS OPERATION

**SFNPRM Alternative 2: Section 73.190 Critical Hours Figures Revised to Reference Distance From 0.5 mV/m Contour
(in Lieu of 0.1 mV/m Contour) of Class A AM Stations**

Critical Hours Time Period	Interference Caused Within Class A 0.1 mV/m Groundwave Contour By Class D Operations Per Alternative 2			Interference Caused Within Class A 0.5 mV/m Groundwave Contour By Class D Operations Per Alternative 2		
	Population:	Area (square kilometers):	Percentage of Interference to Population Within 0.1 mV/m Groundwave Contour:	Population:	Area (square kilometers):	Percentage of Interference to Population Within 0.5 mV/m Groundwave Contour:
One Hour Before Sunset (Figure 2.1-C)	0	0	0%	0	0	0%
One-Half Hour Before Sunset (Figure 2.2-C)	3,164,763	43,845	35.5%	0	0	0%
One-Quarter Hour Before Sunset (Figure 2.3-C)	5,613,567	69,983	63%	26,001	863	0.9%

WBT, CHARLOTTE, NORTH CAROLINA
1110 kHz 50 kW DA-N
JANUARY 2019

WBT DAYTIME OPERATION

0.1 mV/m Groundwave (Presently Protected Contour)	Interference Caused to Class A 0.1 mV/m Groundwave Contour By Maximized Class D Daytime Operations Per <i>SFNPRM</i> Daytime Proposal (Figure 1-D)
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Population:	Population:	Percentage of Interference to Population Within 0.1 mV/m Groundwave Contour:
8,908,617	4,268,297	47.9%

**GAIN IN CLASS D STATION'S DAYTIME OPERATION IN THE DIRECTION OF WBT
WITH MAXIMUM POWER IN THE DIRECTION OF WBT (Figures 2-D through 6-D)**

Maximizing Class D Station	Gain by Population (Persons) and Area (square kilometers)	Figure
WYMW	30,903/1,403	2-D
WUAT	67,120/1,386	3-D
WCBR	35,008/2,239	4-D
WKQA	39,863/2,332	5-D
WEAF	83,579/2,234	6-D
COLLECTIVE GAIN:	256,473/9,594	

**NET LOSS IN SERVICE FROM *SFNPRM* DAYTIME PROPOSAL (CLASS A AM STATION
LOSS MINUS COLLECTIVE GAIN IN CLASS D SERVICE):**

4,268,297 (Loss of Class A AM Service) – 256,473 (Collective Class D Gain) = 4,011,824 persons Net Loss¹

¹ This figure represents the net loss assuming upgrades by the listed neighboring Class D stations. Potentially different populations within the studied Class A AM station could be subject to interference depending upon future neighboring upgrades, with up to 5,905,432 persons subject to loss of service (WBT's 0.1 mV/m daytime contour population of 8,908,617 minus WBT's 0.5 mV/m daytime contour population of 3,003,185 = 5,905,432).

Grid Based Incoming Interference Population Report

Station Information:

Call: WBT
 Freq: 1110 kHz
 CHARLOTTE, NC, US
 Hours: N
 Lat: 35-07-56 N
 Lng: 080-53-23 W
 Power: 50.0 kW
 Theo RMS: 2558.86 mV/m @ 1km @ 50.0 kW
 # of Augmentations: 22

#	Field Ratio	Phase (deg)	Spacing (deg)	Orient (deg)	Height (deg)	Ref Switch	TL Switch	A (deg)	B (deg)	C (deg)	D (deg)
1	0.507	49.0	0.0	0.0	174.0	0	0	0.0	0.0	0.0	0.0
2	1.000	0.0	144.0	115.0	174.0	0	0	0.0	0.0	0.0	0.0
3	0.507	-47.5	288.0	115.0	174.0	0	0	0.0	0.0	0.0	0.0

#	Azimuth (deg)	Radiation (mV/m@1km)	Span (deg)
1	45.00	4506.16	70.0
2	80.00	3057.75	70.0
3	115.00	2172.61	70.0
4	150.00	3211.93	70.0
5	230.00	1528.88	50.0
6	255.00	233.35	10.0
7	260.00	144.84	10.0
8	265.00	104.61	10.0
9	270.00	107.83	10.0
10	275.00	107.83	10.0
11	280.00	107.83	10.0
12	285.00	117.48	10.0
13	290.00	98.17	10.0
14	295.00	88.51	10.0
15	300.00	88.50	10.0
16	305.00	141.62	10.0
17	310.00	88.50	10.0
18	315.00	83.69	10.0
19	320.00	88.50	10.0
20	325.00	160.93	10.0
21	330.00	193.12	10.0
22	335.00	225.31	10.0

Theoretical RMS: 2558.86 mV/m@1km Erss = 2615.07 mV/m@1km
 Standard RMS: 2687.83 mV/m@1km Q = 70.71 mV/m@1km
 Augmented RMS: 2730.26 mV/m@1km

Study Information:

Calculation Area: SkyWave 500.0 uV/m
Grid Size: 500 x 500
Reference Propagation Model: Groundwave + Skywave
Interference Propagation Model: Groundwave + Skywave
Ratios:
 Co-channel: 20.0
 First Adjacent: 2.0
 Second Adjacent: 0.033
 Third Adjacent: 0.033
Ix signals combined using RSS methodology: Yes
 RSS Cutoff Percentage: 50.0
Threshold for reception: 0.5 mV/m
Population Database: 2010 US Census (PL)

Summary:

Total Station Coverage: 99,838,913 (2810268.3 sq. km)
Total Interference: 79,523,475 (2295970.5 sq. km)

Interference Free Coverage: 20,315,438 (514307.9 sq. km)

Stations Causing Interference:

Call Letters	Area (sq. km)	Housing Units	Population
WSFW_N	321,634	22,164,942	53,326,084
WTBQ_N	441,940	21,690,406	52,088,074
WNAP_N	278,673	16,216,654	39,386,415
WTIS	993,667	7,111,567	15,081,146
WGNZ_N	178,030	3,940,250	8,570,625
WKQA	1,219,580	2,587,733	5,690,173
WSLV	71,159	1,158,467	2,616,612
WJSM	28,183	850,287	2,078,835
WUAT	32,183	800,761	1,910,134
WUNN_N	29,945	562,558	1,219,926
WYMW	12,748	326,562	699,463
WCBR	12,111	192,104	403,206

Interference Free Breakdown:

White:	12,742,155	[62.7%]
Black:	5,098,002	[25.1%]
Hispanic:	1,541,109	[7.6%]
Native American:	134,905	[0.7%]
Asian:	428,654	[2.1%]
Pacific Islander:	11,031	[0.1%]

Grid Based Incoming Interference Population Report

Station Information:

Call: WBT
Freq: 1110 kHz
CHARLOTTE, NC, US
Hours: D
Lat: 35-07-56 N
Lng: 080-53-23 W
Power: 50.0 kW
Theo RMS: 374.98 mV/m @ 1km @ 1kW

#	Field Ratio	Phase (deg)	Spacing (deg)	Orient (deg)	Height (deg)	Ref Swch	TL Swch	A (deg)	B (deg)	C (deg)	D (deg)
1	1.000	0.0	0.0	0.0	174.0	0	0	0.0	0.0	0.0	0.0

Study Information:

Calculation Area: GW 0.1 mV/m
Grid Size: 500 x 500
Reference Propagation Model: Groundwave
Interference Propagation Model: Groundwave
Ratios:
 Co-channel: 20.0
 First Adjacent: 1.0
 Second Adjacent: 0.033
 Third Adjacent: 0.033
Ix signals combined using RSS methodology: Yes
 RSS Cutoff Percentage: 50.0
Threshold for reception: 0.1 mV/m
Population Database: 2010 US Census (PL)

Summary:

Total Station Coverage: 8,908,617 (103644.7 sq. km)
Total Interference: 4,268,297 (54458.1 sq. km)
Interference Free Coverage: 4,640,320 (49170.0 sq. km)

Stations Causing Interference:

Call Letters	Area (sq. km)	Housing Units	Population
WKQA	13,938	802,414	1,866,207
WUAT	13,927	540,009	1,179,713
WMUX	16,362	521,830	1,092,330
WEAF	18,752	402,722	939,873

WCBR	13,396	380,284	748,247
WMBI	(Not Considered In Report)		
WBIB	(Not Considered In Report)		
WKDZ	(Not Considered In Report)		
WOMN	(Not Considered In Report)		
WUNN	(Not Considered In Report)		
WKRA	(Not Considered In Report)		
WJSM	(Not Considered In Report)		
WSLV	(Not Considered In Report)		
WTOF	(Not Considered In Report)		
WTBQ	(Not Considered In Report)		
WSFW	(Not Considered In Report)		
WNAP	(Not Considered In Report)		
WGNZ	(Not Considered In Report)		
WTIS	0	0	0
CFQI	(Not Considered In Report)		
1110CKTY	(Not Considered In Report)		
WWWE	(Not Considered In Report)		
WTAM	(Not Considered In Report)		
WSGI	(Not Considered In Report)		
WCGA	(Not Considered In Report)		
WHOG	(Not Considered In Report)		
WKCE	(Not Considered In Report)		
WSME	(Not Considered In Report)		
WXJO	(Not Considered In Report)		
WXJO	(Not Considered In Report)		
WUST	(Not Considered In Report)		
WUST	(Not Considered In Report)		

Interference Free Breakdown:

White:	3,052,996	[65.8%]
Black:	1,030,450	[22.2%]
Hispanic:	355,396	[7.7%]
Native American:	20,693	[0.4%]
Asian:	103,836	[2.2%]
Pacific Islander:	1,638	[0.0%]
Mixed Race:	67,941	[1.5%]
Other:	7,370	[0.2%]

Total: 4,640,320

	Housing Units	Population	%
Georgia			
Columbia County			
Total	48,626	124,053	
WBT Coverage	796	2,381	
WUAT	796	2,381	100.00
WEAF	775	2,333	97.98
Elbert County			