

Goldsboro, North Carolina

Application for Minor Modification of FM Translator W252CL

On Channel 252

by

Eastern Airwaves, LLC

Exhibit 13

Interference Analysis

February 2016

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Declaration

I declare, under penalty of perjury, that I am a technical consultant to broadcasting and other communications systems, that I have over twenty-five years of experience in the engineering of broadcast and other communications systems, that I am familiar with the Federal Communications Commission's Rules found in the Code of Federal Regulations Title 47, that I am a Professional Engineer registered in North Carolina, that I have prepared or supervised the preparation of the attached Exhibit 13, Interference Analysis, for Eastern Airwaves, LLC, and that all of the facts therein, except for facts of which the Federal Communications Commission may take official notice, are true to the best of my knowledge and belief.



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26 February 2016

Narrative

This Exhibit supports an amendment to a minor modification application for FM translator W252CL, on Channel 252 in Goldsboro, North Carolina. Allocation details are provided in this exhibit. This proposal complies fully with the requirements of 74 C.F.R. §74.1204(a), with the exception of facilities protected under 47 C.F.R. §74.1204(d) by the Undesired to Desired (U/D) method described below. The proposed modified facilities create no mutual exclusivities with any licensed facilities, construction permits, or applications as shown in the allocation table in this exhibit.

Figure 1 shows the proposed 60 dBu F(50,50) coverage area. Figure 1 shows fill-in status confirmation.

The changes are limited to a new antenna.

Allocations

This application proposes service to Goldsboro, North Carolina, on channel 252. An updated Table 1: Allocations is included in this exhibit with a list of the stations, construction permits, allocations, and applications studied. All are protected under §74.1204(a) contour protection by this application, with the exception of facilities protected by the Undesired to Desired (U/D) method. Facilities protected by the U/D method are listed in Table 2. The allocations table was prepared using the NGDC 30 arcsecond terrain database which is described below. Where the outgoing protection is provided by interference contours with a separation of less than 3.2 kilometers (2 miles), the lack of overlap is plotted in figures in this

exhibit, and the output of the FM Over program is provided. For this application, there is one (1) facility for which additional detail is provided.

Table and Figure	Call Sign	Location	Channel, class and relationship
3	WQSM	Fayetteville, North Carolina	251C1, first adjacent

Note that CDBS still contains information about DW225AL, Goldsboro. The license was cancelled and the renewal application, BRFT-20110728AGL, was dismissed on 7/21/2015. No protection to DW255AL is shown in this application. However, protection can be provided. Additional details will be provided upon request.

Table 1: Allocations

Allocation Study Eastern Airwaves LLC											
REFERENCE	CH# 252D - 98.3 MHz, Pwr= 0.25 kW, HAAT= 75.5 M, COR= 110 M								DISPLAY	DATES	
35 22 27.0 N.	Average	Protected	F(50-50)=	11.3 km	DATA	02-25-16					
78 00 43.0 W.	Omni-directional		Omni-directional		SEARCH	02-25-16					
CH CITY	CALL	TYPE	ANT STATE	AZI. <--	DIST FILE #	LAT. FILE #	Pwr(kw) HAAT(M)	INT(km) COR(M)	PRO(km) LICENSEE	*IN*	*OUT*
252D Goldsboro	W252CL!	LIC	C NC	0.0 0.0	0.00 BLFT20140122ABG	35 22 27.0 78 00 43.0	0.250 76	38.7 110	11.3 Eastern Airwaves LLC	-50.0	-50.0
Facility being modified.											
251C1 Fayetteville	WQSM	LIC	CN NC	248.9 68.3	89.98 BLH19871125KA	35 04 46.0 78 55 58.0	100.000 253	102.6 307	70.4 Cumulus Licensing LLC	-24.1*	3.1
249A Walnut Creek	WZKT	LIC	CX NC	118.3 298.4	19.44 BLH20080501AAS	35 17 28.0 77 49 25.0	2.650 153	2.5 182	28.1 New Age Communications, Inc.	5.5	-9.8*
Protected by U/D contour, see text and figures.											
253C3 Rocky Mount	WDWG	LIC	CN NC	14.9 195.0	61.78 BLH19951122KA	35 54 43.0 77 50 06.0	16.000 125	58.8 163	38.7 First Media Radio, LLC	-7.9	7.1
255D Goldsboro	DW255AL	LIC	C NC	29.6 209.7	4.47 BLFT20001220ADE	35 24 33.0 77 59 15.0	0.170 32	0.9 66	6.7 Radio Training Network, Inc.	-7.5*	-3.3*
Not addressed; should protection be requested, additional study will be provided.											
252A Washington	WLGT	LIC	CN NC	81.6 262.1	88.69 BLH19890227KF	35 29 14.0 77 02 42.0	1.350 149	72.4 159	24.0 Media East, LLC	5.0	26.2
252C3 Clarksville	WLUS-FM	LIC	ZCN VA	338.8 158.5	133.73 BLH20011017ACH	36 29 45.0 78 33 16.0	17.500 119	104.9 236	36.4 Lakes Media, LLC	18.2	58.2
255C3 Bethel	WLXB	LIC	C NC	50.7 231.0	73.52 BMLED20150303AAM	35 47 29.0 77 22 54.0	11.200 149	3.9 163	39.5 Educational Media Foundation	58.3	32.9
255C3 Bethel	AL7051	RSV-A	NC	49.8 230.1	74.81 RM10857	35 48 25.0 77 22 44.0	25.000 100	4.1 114	39.7	59.4	33.9
Chg. of Comm. from Windsor.											
252D Pumpkin Center	W252B0	CP	C NC	140.0 320.3	88.08 BPFT20140128AEH	34 45 57.0 77 23 29.0	0.250	35.0 69	10.4 Down East Broadcasting Com	40.6	34.6
252D Pumpkin Center	W252B0	LIC	C NC	140.4 320.7	85.41 BLFT20070306AAB	34 46 50.0 77 24 56.0	0.055 53	22.1 62	6.6 Down East Broadcasting Com	50.8	35.7
254C1 Jacksonville	WRMR	LIC	CN NC	153.8 334.1	108.64 BLH19990401KE	34 29 41.0 77 29 19.0	100.000 297	10.0 303	71.6 Sunrise Broadcasting, LLC	86.3	36.0
252C3 Oak Island	WUIN	LIC	NC NC	180.5 0.5	156.75 BLH20000807AHJ	33 57 40.0 78 01 37.0	18.500 116	108.8 120	38.5 Davis Media, LLC	37.1	81.4
2/9/01: Pursuant to Report and Order, DA 01-272, the name of the city of license was changed from Long Beach to Oak Island when the towns of Long Beach and Yaupon Beach consolidated.											
254D Clayton	W254BV	LIC	DC NC	305.5 125.2	58.13 BLFT20121011AAU	35 40 35.0 78 32 08.0	0.250 194	1.1 274	18.1 Radio Training Network, Inc	46.2	38.7
249D Dunn	W263CC	CP	C NC	259.4 79.1	54.13 BPFT20160129AKD	35 17 00.0 78 35 49.0	0.250	1.1 140	11.7 Positive Alternative Radio	41.3	41.3
250D Winterville	W250CJ	LIC	C NC	62.1 242.4	55.70 BLFT20150716AAK	35 36 25.0 77 28 05.0	0.155	0.9 119	11.6 Inner Banks Media, LLC	43.5	43.0

Terrain database is NGDC 30 SEC, R= 73.215 qualifying spacings or FCC minimum spacings in KM, M= Margin in KM In & Out distances between contours are shown at closest points. Reference Zone= East Zone, Co to 3rd adj. All separation margins (if shown) include rounding. Call signs with exclamation marks need not be protected. Ant Column: (D= DA Standard, Z= DA 73.215, N= Not DA 73.215, _= Omni), Polarization (C,H,V,E), Beamtilt(Y,N,X) **"affixed to 'IN' or 'OUT' values = site inside restricted contour. Reference station has protected zone issue: AM tower: WGBR

Table 2: Facilities Protected by U/D Method

Facility	WZKT Walnut Creek, North Carolina
Relationship	249A, third adjacent
Distance (km)	19.45
Bearing (degrees)	118.3
ERP (kW, on azimuth)	2.65
HAAT (m, on azimuth)	150.1
Ratio	40
Signal Strength (dBu)	67.0
Translator Signal Strength	107.0
Translator distance (km)	.496

Undesired to Desired Method under §74.1204(d)

Protection to some facilities is provided through the use of Undesired to Desired Signal Strength Ratio (U/D) calculations. Table 2 lists the parameters studied. The proposed antenna is a Shively 6832-4 four level omnidirectional antenna. The 6832 antennas have a 98 inch standard spacing, which is 0.82 wavelength spacing at this frequency. The elevation pattern is shown in Figure 2. The elevation of the 107.0 dBu contour is shown in Figure 4.

The WZKT field strength calculated at ground level at the proposed W252CL site is 67.0 dBu, using the FM Curves calculator on the FCC web site. For the translator interference contour, free space calculations are used. The corresponding 107.0 dBu field strength distance is .496 kilometers in the horizontal plane. The proposed antenna location is 87 meters above ground. As Figure 4 shows, the 107.0 dBu signal level does not reach ground level.

Figure 5 is a topographic map of the transmitter site, showing that the site is on level terrain. Figure 6 is a Google Earth aerial photograph with a 107.0 field strength line plotted. As shown, there are no tall buildings within the contour. There is no population within the predicted interference area and therefore this facility is permitted under §74.1204(d).

The applicant recognizes that the U/D method is only a tool for predicting likely interference. Should any actual interference be experienced, the applicant will cooperate fully in correcting the interference. Corrective steps may require changes in the transmitting antenna or other steps which would require Commission authorization, may require that the translator cease operation except for brief equipment tests, or may require filtering at the receivers which report interference.

Source of Data

Transmitter location, effective radiated power, directional antenna pattern, and elevation data are extracted from the Commission's CDBS. All contours for existing and proposed facilities are calculated using height above average terrain calculated at one degree horizontal increments.

The contours were evaluated using terrain extracted from the National Geophysical Data Center's (NGDC) 30 arcsecond terrain database, formatted by V-Soft Communications. This is the same database in use at the Federal Communications Commission. The terrain data is formatted by V-Soft Communications® for use with its FMCommander allocations and Probe™ mapping programs.

All population data is from 2010 U.S. Census PL data files. Population is counted by considering the location of the centroid of each census block. The data for each block is counted if it falls within the area being counted.

Table 3: FM Over Output for Protection of WQSM

02-25-2016 Terrain Data: NGDC 30 SEC FMOver Analysis

WQSM BLH19871125KA

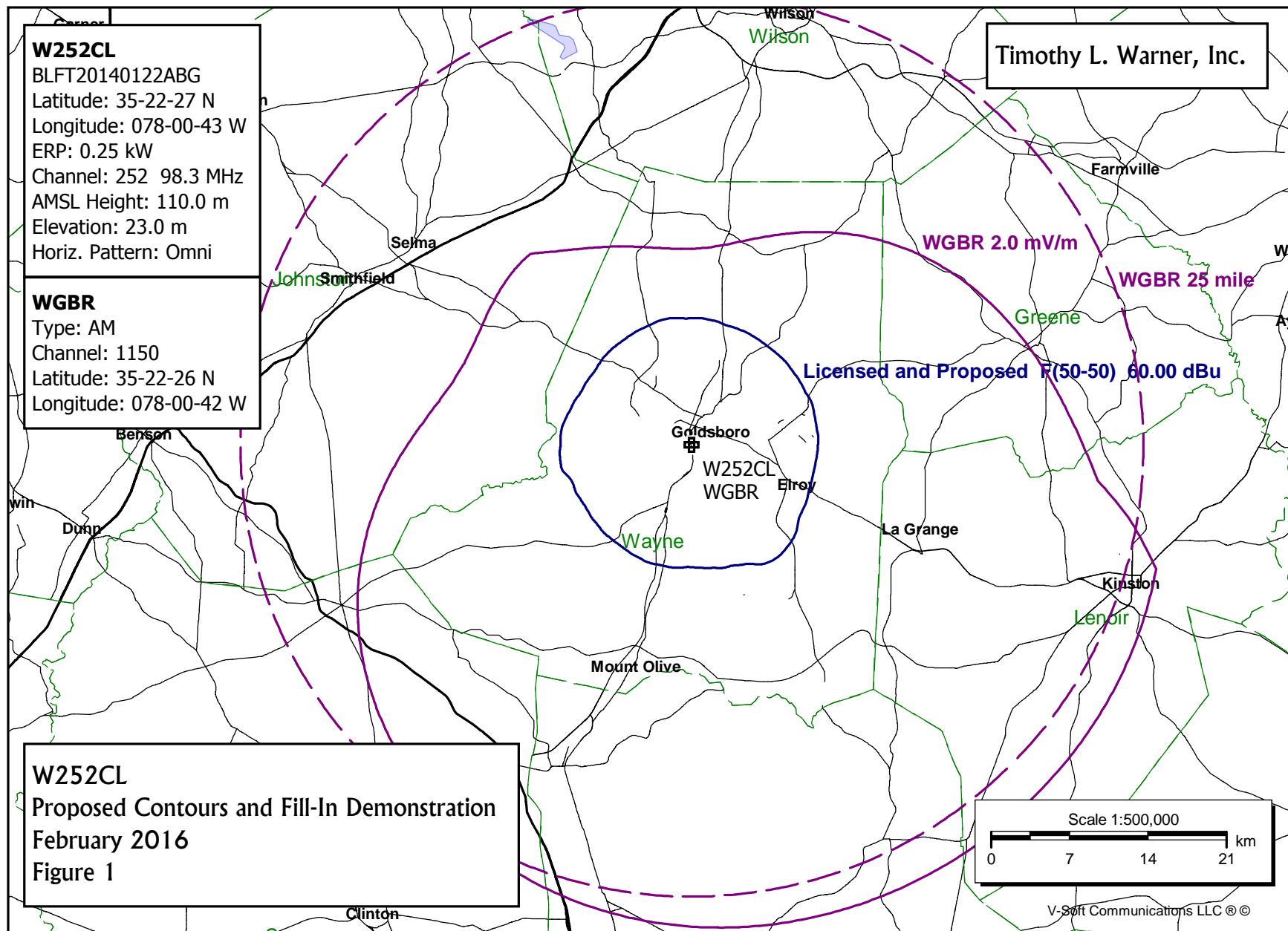
W252CL

Channel = 251c1
 Max ERP = 100 kW
 RCAMSL = 307 m
 N. Lat. 35 04 46.0
 W. Lng. 78 55 58.0
 Protected
 60 dBu

Channel = 252D
 Max ERP = 0.25 kW
 RCAMSL = 110 m
 N. Lat. 35 22 27.0
 W. Lng. 78 00 43.0
 Interfering
 54 dBu

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)	IX (km)
008.0	100.0000	0242.6	067.6	295.1	000.2500	0069.7	081.6	26.08	
009.0	100.0000	0242.6	067.6	295.3	000.2500	0069.6	080.4	26.36	
010.0	100.0000	0242.7	067.6	295.5	000.2500	0069.5	079.3	26.65	
011.0	100.0000	0242.9	067.7	295.8	000.2500	0069.4	078.1	26.94	
012.0	100.0000	0243.0	067.7	296.0	000.2500	0069.3	077.0	27.23	
013.0	100.0000	0243.4	067.7	296.2	000.2500	0069.2	075.8	27.53	
014.0	100.0000	0244.4	067.8	296.5	000.2500	0069.2	074.7	27.82	
015.0	100.0000	0245.5	067.9	296.7	000.2500	0069.1	073.6	28.11	
016.0	100.0000	0246.5	067.9	296.9	000.2500	0069.0	072.4	28.41	
017.0	100.0000	0246.9	068.0	297.1	000.2500	0068.9	071.2	28.72	
018.0	100.0000	0247.3	068.0	297.3	000.2500	0068.9	070.1	29.02	
019.0	100.0000	0247.9	068.1	297.5	000.2500	0068.8	068.9	29.33	
020.0	100.0000	0248.8	068.1	297.7	000.2500	0068.8	067.7	29.64	
021.0	100.0000	0249.6	068.2	297.9	000.2500	0068.7	066.6	29.95	
022.0	100.0000	0250.2	068.3	298.0	000.2500	0068.7	065.4	30.27	
023.0	100.0000	0250.8	068.3	298.2	000.2500	0068.7	064.2	30.59	
024.0	100.0000	0251.5	068.4	298.3	000.2500	0068.6	063.0	30.92	
025.0	100.0000	0252.2	068.4	298.4	000.2500	0068.6	061.8	31.26	
026.0	100.0000	0253.0	068.5	298.5	000.2500	0068.6	060.6	31.62	
027.0	100.0000	0253.8	068.6	298.6	000.2500	0068.6	059.4	31.99	
028.0	100.0000	0254.3	068.6	298.7	000.2500	0068.5	058.2	32.36	
029.0	100.0000	0254.7	068.6	298.7	000.2500	0068.5	057.0	32.75	
030.0	100.0000	0255.4	068.7	298.7	000.2500	0068.5	055.8	33.14	
031.0	100.0000	0256.2	068.8	298.7	000.2500	0068.5	054.6	33.54	
032.0	100.0000	0257.2	068.8	298.8	000.2500	0068.5	053.4	33.94	
033.0	100.0000	0258.1	068.9	298.7	000.2500	0068.5	052.2	34.34	
034.0	100.0000	0259.2	069.0	298.7	000.2500	0068.5	051.0	34.75	
035.0	100.0000	0260.4	069.1	298.7	000.2500	0068.5	049.8	35.15	
036.0	100.0000	0261.6	069.2	298.6	000.2500	0068.6	048.6	35.55	
037.0	100.0000	0262.5	069.3	298.5	000.2500	0068.6	047.4	35.95	
038.0	100.0000	0263.2	069.3	298.3	000.2500	0068.6	046.2	36.37	
039.0	100.0000	0263.8	069.4	298.1	000.2500	0068.7	045.0	36.79	
040.0	100.0000	0264.2	069.4	297.8	000.2500	0068.8	043.8	37.23	
041.0	100.0000	0264.6	069.5	297.5	000.2500	0068.8	042.6	37.67	
042.0	100.0000	0265.1	069.5	297.1	000.2500	0069.0	041.4	38.13	
043.0	100.0000	0265.6	069.5	296.7	000.2500	0069.1	040.2	38.60	
044.0	100.0000	0266.1	069.6	296.2	000.2500	0069.2	039.1	39.08	
045.0	100.0000	0266.7	069.6	295.7	000.2500	0069.4	037.9	39.57	
046.0	100.0000	0267.2	069.7	295.1	000.2500	0069.7	036.7	40.08	
047.0	100.0000	0267.7	069.7	294.4	000.2500	0070.1	035.6	40.61	
048.0	100.0000	0268.3	069.8	293.7	000.2500	0070.5	034.5	41.15	
049.0	100.0000	0269.1	069.8	292.9	000.2500	0071.0	033.3	41.70	
050.0	100.0000	0269.8	069.9	292.0	000.2500	0071.6	032.2	42.27	
051.0	100.0000	0270.6	070.0	291.0	000.2500	0072.2	031.1	42.85	
052.0	100.0000	0271.3	070.0	289.9	000.2500	0072.8	030.1	43.49	
053.0	100.0000	0271.8	070.1	288.7	000.2500	0073.6	029.0	44.15	
054.0	100.0000	0272.1	070.1	287.3	000.2500	0074.4	028.0	44.85	
055.0	100.0000	0272.3	070.1	285.7	000.2500	0075.4	027.0	45.59	
056.0	100.0000	0272.4	070.1	284.0	000.2500	0076.8	026.1	46.36	
057.0	100.0000	0272.4	070.1	282.1	000.2500	0078.1	025.2	47.12	
058.0	100.0000	0272.4	070.1	280.0	000.2500	0079.6	024.4	47.88	
059.0	100.0000	0272.4	070.1	277.7	000.2500	0080.7	023.6	48.58	
060.0	100.0000	0272.3	070.1	275.3	000.2500	0081.0	022.9	49.15	
061.0	100.0000	0272.4	070.1	272.7	000.2500	0080.9	022.2	49.66	
062.0	100.0000	0272.7	070.1	269.9	000.2500	0080.9	021.6	50.14	
063.0	100.0000	0273.2	070.2	267.0	000.2500	0081.7	021.0	50.67	
064.0	100.0000	0273.7	070.2	263.9	000.2500	0081.8	020.5	51.08	
065.0	100.0000	0274.3	070.3	260.6	000.2500	0081.7	020.1	51.39	

066.0	100.0000	0274.7	070.3	257.2	000.2500	0078.2	019.8	51.26
067.0	100.0000	0275.2	070.4	253.7	000.2500	0072.4	019.6	50.77
068.0	100.0000	0275.6	070.4	250.1	000.2500	0071.6	019.5	50.78
069.0	100.0000	0275.9	070.4	246.5	000.2500	0070.9	019.5	50.71
070.0	100.0000	0276.3	070.4	242.9	000.2500	0069.4	019.5	50.46
071.0	100.0000	0276.7	070.5	239.3	000.2500	0068.8	019.7	50.25
072.0	100.0000	0276.9	070.5	235.8	000.2500	0069.6	020.0	50.11
073.0	100.0000	0277.1	070.5	232.5	000.2500	0069.9	020.4	49.84
074.0	100.0000	0277.1	070.5	229.4	000.2500	0070.0	020.9	49.47
075.0	100.0000	0277.0	070.5	226.4	000.2500	0071.1	021.4	49.15
076.0	100.0000	0277.2	070.5	223.6	000.2500	0070.9	022.0	48.63
077.0	100.0000	0277.3	070.5	221.0	000.2500	0070.7	022.7	48.08
078.0	100.0000	0277.5	070.5	218.6	000.2500	0070.6	023.5	47.50
079.0	100.0000	0277.6	070.6	216.4	000.2500	0070.3	024.3	46.87
080.0	100.0000	0277.7	070.6	214.3	000.2500	0070.1	025.1	46.24
081.0	100.0000	0277.8	070.6	212.4	000.2500	0070.0	026.0	45.61
082.0	100.0000	0277.8	070.6	210.7	000.2500	0070.3	027.0	45.02
083.0	100.0000	0277.9	070.6	209.2	000.2500	0070.9	027.9	44.47
084.0	100.0000	0278.1	070.6	207.8	000.2500	0071.3	029.0	43.92
085.0	100.0000	0278.3	070.6	206.5	000.2500	0071.4	030.0	43.35
086.0	100.0000	0278.4	070.6	205.3	000.2500	0071.4	031.0	42.80
087.0	100.0000	0278.3	070.6	204.3	000.2500	0071.6	032.1	42.30
088.0	100.0000	0278.3	070.6	203.3	000.2500	0071.9	033.2	41.84
089.0	100.0000	0278.0	070.6	202.5	000.2500	0072.1	034.4	41.37
090.0	100.0000	0277.8	070.6	201.8	000.2500	0072.3	035.5	40.89
091.0	100.0000	0277.6	070.6	201.1	000.2500	0072.5	036.7	40.42
092.0	100.0000	0277.3	070.5	200.6	000.2500	0072.5	037.8	39.93
093.0	100.0000	0277.1	070.5	200.1	000.2500	0072.5	039.0	39.45
094.0	100.0000	0276.8	070.5	199.6	000.2500	0072.4	040.2	38.96
095.0	100.0000	0276.5	070.5	199.2	000.2500	0072.3	041.4	38.49
096.0	100.0000	0276.3	070.4	198.8	000.2500	0072.1	042.6	38.02
097.0	100.0000	0276.3	070.4	198.5	000.2500	0072.0	043.8	37.55
098.0	100.0000	0276.7	070.5	198.2	000.2500	0071.9	045.0	37.10
099.0	100.0000	0277.1	070.5	197.9	000.2500	0071.8	046.2	36.67
100.0	100.0000	0277.5	070.6	197.7	000.2500	0071.7	047.4	36.24
101.0	100.0000	0277.9	070.6	197.5	000.2500	0071.6	048.6	35.82
102.0	100.0000	0278.1	070.6	197.3	000.2500	0071.5	049.9	35.41
103.0	100.0000	0278.3	070.6	197.2	000.2500	0071.5	051.1	34.99
104.0	100.0000	0278.5	070.6	197.1	000.2500	0071.4	052.3	34.57
105.0	100.0000	0278.9	070.7	197.0	000.2500	0071.4	053.6	34.15
106.0	100.0000	0279.2	070.7	197.0	000.2500	0071.4	054.8	33.73
107.0	100.0000	0279.7	070.7	196.9	000.2500	0071.4	056.0	33.32
108.0	100.0000	0280.1	070.8	196.9	000.2500	0071.3	057.2	32.91
109.0	100.0000	0280.3	070.8	196.9	000.2500	0071.4	058.5	32.51
110.0	100.0000	0280.4	070.8	197.0	000.2500	0071.4	059.7	32.11
111.0	100.0000	0280.4	070.8	197.1	000.2500	0071.4	060.9	31.73
112.0	100.0000	0280.3	070.8	197.2	000.2500	0071.5	062.2	31.37
113.0	100.0000	0280.3	070.8	197.3	000.2500	0071.5	063.4	31.01
114.0	100.0000	0280.3	070.8	197.4	000.2500	0071.6	064.6	30.67
115.0	100.0000	0280.4	070.8	197.6	000.2500	0071.6	065.8	30.34
116.0	100.0000	0280.4	070.8	197.7	000.2500	0071.7	067.1	30.01
117.0	100.0000	0280.4	070.8	197.9	000.2500	0071.7	068.3	29.69
118.0	100.0000	0280.3	070.8	198.1	000.2500	0071.8	069.5	29.36
119.0	100.0000	0280.0	070.8	198.3	000.2500	0071.9	070.7	29.04
120.0	100.0000	0279.8	070.7	198.5	000.2500	0072.0	071.9	28.73
121.0	100.0000	0279.7	070.7	198.7	000.2500	0072.1	073.1	28.41
122.0	100.0000	0279.5	070.7	198.9	000.2500	0072.2	074.3	28.10
123.0	100.0000	0279.2	070.7	199.2	000.2500	0072.3	075.5	27.79
124.0	100.0000	0279.0	070.7	199.4	000.2500	0072.3	076.7	27.48
125.0	100.0000	0278.8	070.7	199.7	000.2500	0072.4	077.9	27.18
126.0	100.0000	0278.7	070.7	199.9	000.2500	0072.5	079.1	26.87
127.0	100.0000	0278.8	070.7	200.2	000.2500	0072.5	080.2	26.57



Goldsboro, North Carolina

Eastern

Channel 252D

Antenna Mfg.: Shively
Antenna Type: 6832-4
Station: W252CL
Frequency: 98.3
Channel #: 252
Figure: 2

Date: 2/25/2016

Beam Tilt	0	
Gain (Max)	2.019	3.052 dB
Gain (Horizon)	2.019	3.052 dB

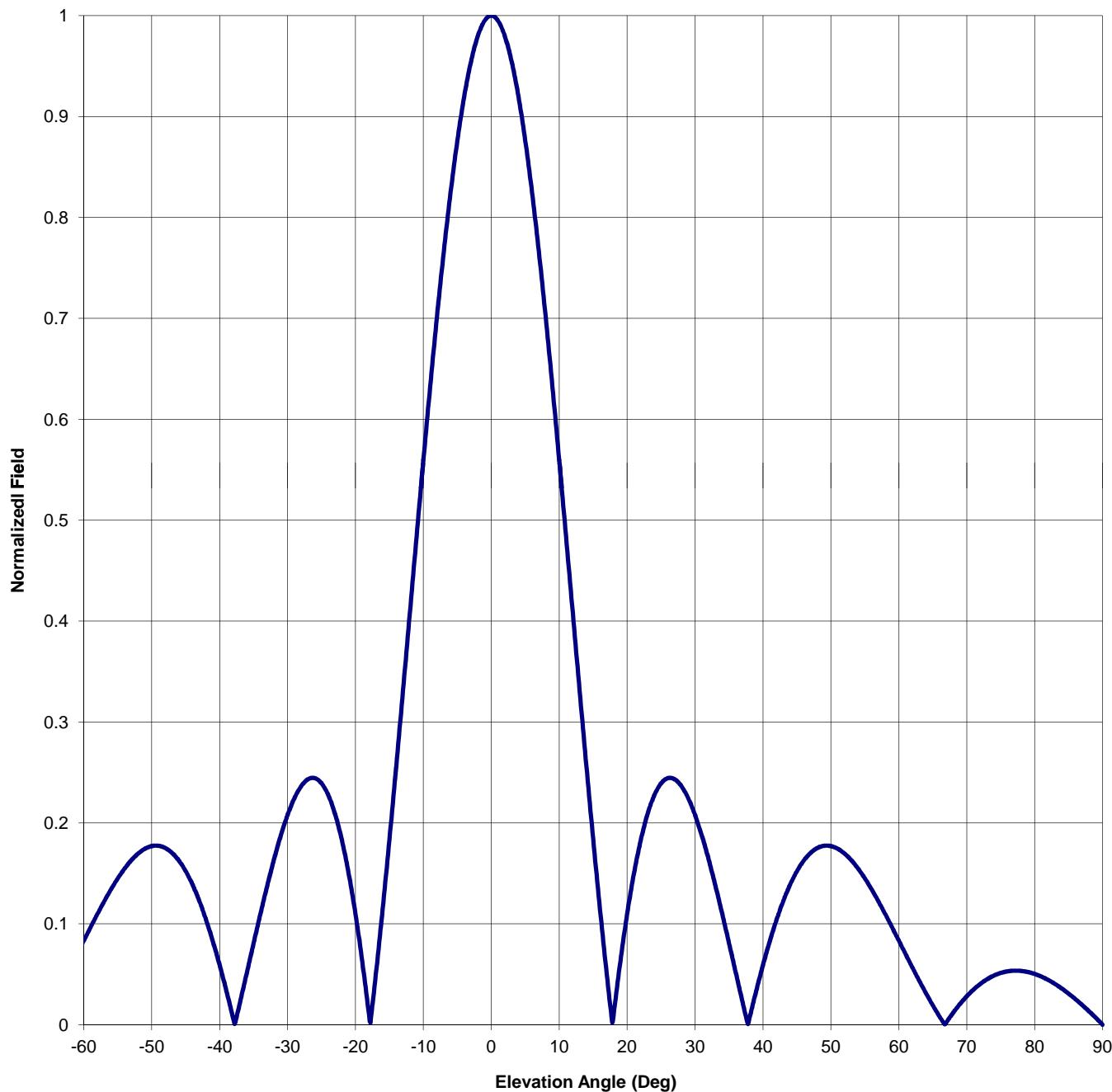
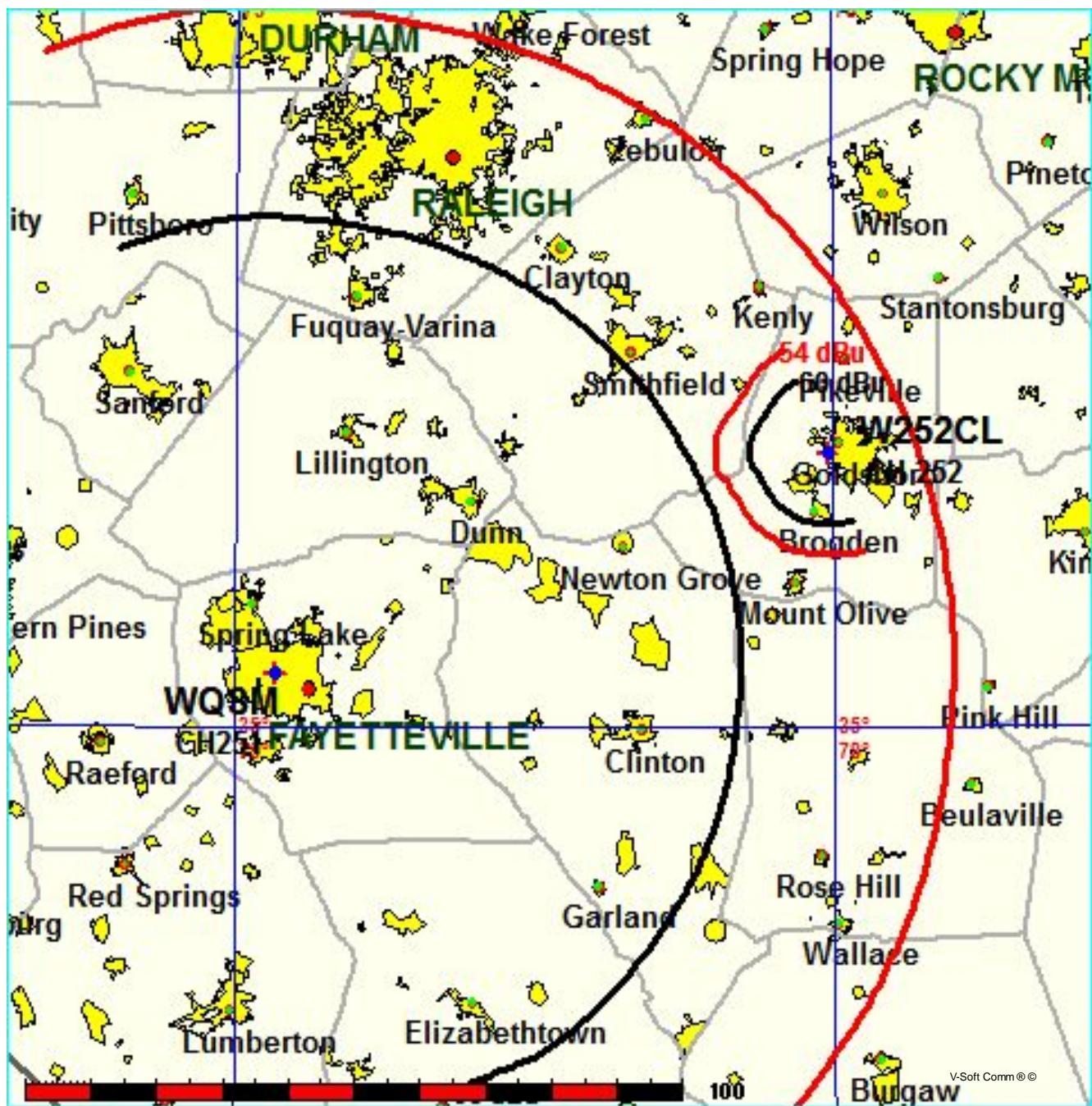


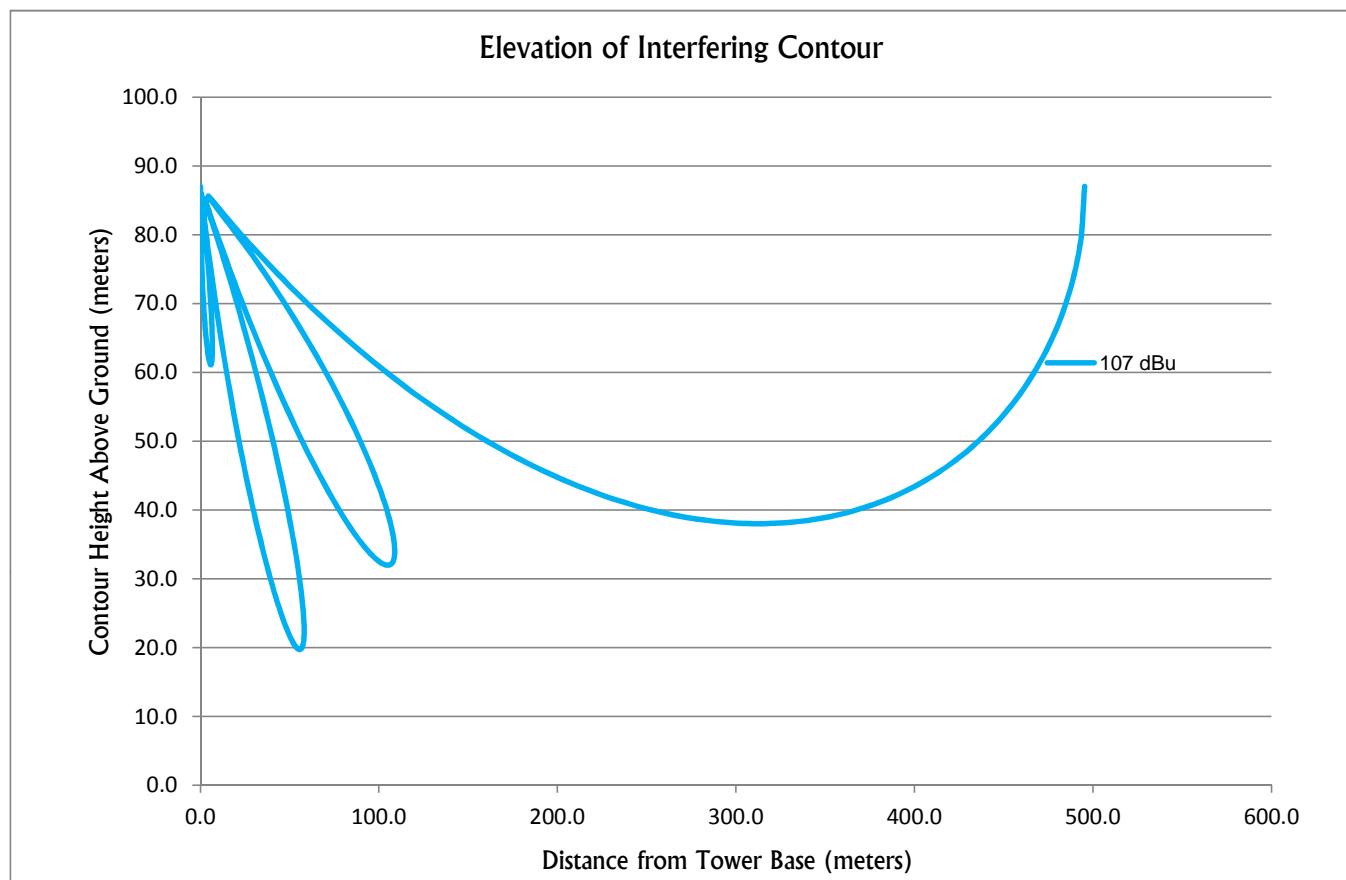
Figure 3: Allocation Study: WQSM
Eastern Airwaves LLC

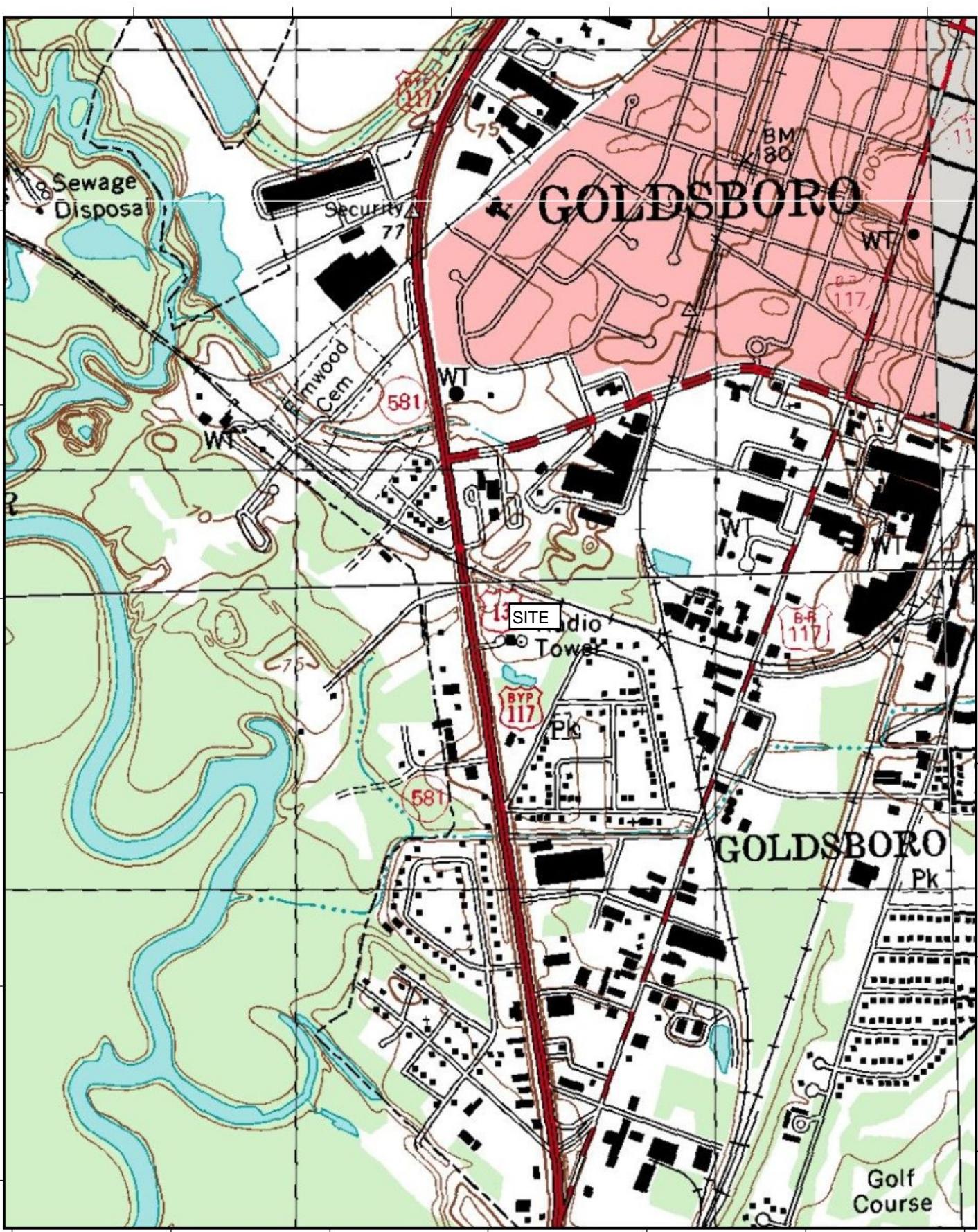
FMCommander Single Allocation Study - 02-25-2016 - NGDC 30 SEC
W252CL's Overlaps (In= -24.11 km, Out= 3.13 km)

W252CL CH 252 D
Lat= 35 22 27.0, Lng= 78 00 43.0
0.25 kW 75.5 m HAAT, 110 m COR
Prot.= 60 dBu, Intef.= 54 dBu

WQSM CH 251 C1 BLH19871125KA
Lat= 35 04 46.0, Lng= 78 55 58.0
100.0 kW 253 m HAAT, 307 m COR
Prot.= 60 dBu, Intef.= 54 dBu







Universal Transverse Mercator (UTM) Projection Zone 17
North American Datum of 1983

1:12500 scale
0 0.1 0.2 0.3 0.4 0.5 Miles
0 0.1 0.2 0.3 0.4 0.5 Kilometers

Topographic Map
Figure 5

Magnetic declination of 7W at center of map
on March 17, 2011



W252CL

Aerial Photograph with Interference Contour
February 2016
Figure 6

Legend

W252CL (252) - 50 10 Field Strength: 107.0 dBu FCC [FCC 30 US]

