

Technical Report Supporting a Minor Change in Licensed Facility Construction Permit Application

Pursuant to 47 C.F.R. Section 74:

for

*W260CF.L - Manchester, NH
(Facility ID: 154234)*

*“Site Relocation &
New Directional Antenna Pattern”*

*as a
Commercial, Fill-In
AM Translator for
WFEA(AM) - Manchester, NH*

Table of Contents

Table of Contents

Explanation of Technical Report

Exhibit 1 - Service Contour Study: Present vs Proposed Operations

Exhibit 2 - Service Contour Study: Proposed vs Primary Operations

Exhibit 3 - Copy of Existing Antenna Structure Registration

Exhibit 4 - Vertical Plan of Antenna System

Exhibit 5 - HAAT Calculation & Miscellaneous Coordinate Information

Exhibit 6 - Tabulation of Proposed Allocation

Exhibit 7(a-b) - Contour Protection Studies Toward Select Allocation Concern(s)

Exhibit 8(a-b) - §74.1204(d) Second / Third Adjacent Given Interference Waiver Request(s)

Exhibit 9 - Manufacturer's Antenna Pattern Documentation

Supplemental Appendix(s):

RF Appendix 1 - Radio Frequency Radiation Compliance Showing

EXPLANATION OF PROPOSAL: This LMS Schedule 349 Filing and accompanying technical report supports a Minor Change in Licensed Facility Construction Permit Application for FM Translator W260CF.L - Manchester, NH (Facility ID: 154234). This filing requests a change in site location and new directional antenna pattern. Continued operation on CH260D (99.9 MHz) with a power of 0.110 kW ERP circular polarization (H&V) is requested. The FM Translator will operate from a COR of 157.3 meters AMSL at the new site location. This filing will specify rebroadcast of Class B, AM Primary Station WFEA(AM) - Manchester, NH (1370 kHz); Facility ID No. 58543. The Translator will remain licensed to the current community of Manchester, NH.

FACILITY COMPLIANCE SHOWINGS: A map of the proposed 60 dBμ service contour in relation to the present 60 dBμ service contour has been included in ***Exhibit 1***. The minor change proposed service area will overlap a portion of the present service area as noted in the exhibit. The proposed 60 dBμ contour of the Translator lies wholly inside the larger of the AM primary daytime 2.0 mV/m contour or a 25 mile radius around the AM site. The primary station service contour relationship has been plotted in ***Exhibit 2***.

The proposed facility will be located on the tower bearing Antenna Structure Registration Number 1218378. In support of this filing, a copy of the existing ASRN has been included in ***Exhibit 3***. A depiction of the tower and antenna configuration has been included in ***Exhibit 4***. Further notification to the FAA or ASR governing authorities is not required as this proposal will not increase the overall tower height.

The applicant would like to note use of the NED 03 second terrain database for all allocation, contour and HAAT showings contained herein. A copy of the proposed HAAT calculation has been included in ***Exhibit 5***.

ALLOCATION COMPLIANCE SHOWINGS: The proposed Translator remains in compliance with 47 C.F.R. Section 74.1204 toward all allocation protection concerns with the exception of WCRB(FM) - Lowell, MA (CH258B); WHEB(FM) - Portsmouth, NH (CH262B); and multiple W253AF - Nashua, NH (CH260D) authorizations. A general allocation study for this proposal is found in ***Exhibit 6***.

The applicant would like to note the existence of a 47 C.F.R. Section 74.1204(d) Second/Third Adjacent Channel Given Interference Waiver Request toward WCRB(FM) - Lowell, MA (CH258B) and WHEB(FM) - Portsmouth, NH (CH262B) as included in **Exhibit(s) 8(a-b)**. In this instance, the worst case affected station's signal strength at the Translator site has been identified as the 55.6 dBμ F(50:50) service contour, associated with a Translator interference contour adjusted by +40 dBμ per 47 C.F.R. Section 74.1204(a). Concerning distances between 150 meters of the Translator site to the extent of the interference contour, protection has been demonstrated through a downward radiation study as included in **Exhibit 8a**. Full protection will be afforded all concerns as this portion of the interference area will not reach the ground nor a five meter artificial plane representing a standard two story home when taking into account the downward radiation characteristics of the antenna as supplied by the antenna manufacturer. A copy of the antenna manufacturer's vertical radiation pattern data has been included in **Exhibit 9**. Concerning distances within 150 meters of the Translator site, protection has been demonstrated through aerial photography of the site as included in **Exhibit 8b**. Full protection will be afforded all concerns as this portion of the interference area is void of all housing, buildings or major roads representing locations where people live, work or travel on a regular basis. The applicant would like to note the existence of several dedicated transmitter buildings within this affected radius, however, buildings of this nature have been routinely exempt as a matter of FCC Policy (see similar grant under BPFT-20160129ALR).

Concerning W253AF - Nashua, NH (Facility ID: 83187), former pending application BMPFT-20180221AAB and granted permit BMPFT-20170713AHQ are believed to no longer require protection. Pending application BMPFT-20180221AAB was dismissed on 05/26/2020, via FCC Letter (Reference: 1800B3-KV). Granted construction permit BMPFT-20170713AHQ expired on 11/30/2019, subsequent to the 05/26/2020 dismissal of pending license application BLFT-20171221AAJ and revocation of underlying license BLFT-19980824TA (W253AF - Bennington, VT) via the same FCC Letter (Reference: 1800B3-KV). The 05/26/2020 FCC Letter (Reference: 1800B3 KV) is a matter of record before the Commission. It should be noted an outstanding 06/29/2020 Petition for Reconsideration has been filed by Absolute Broadcasting, LLC, to reinstate the W253AF filings. However, at present, pending application BMPFT-20180221AAB remains listed as "dismissed" within the CDBS/LMS databases. Likewise, granted construction permit BMPFT-20170713AHQ remains expired as of 11/30/2019. The applicant is not opposed to a grant of this instant application conditioned on the outcome of the outstanding 06/29/2020 Petition for Reconsideration.

There are two (2) facilities, existing or proposed, close enough to merit further study. Therefore, a supplemental contour protection study has been provided toward each facility as included in **Exhibit(s) 7(a-b)**. It is believed sufficient clearance exists precluding the need for additional contour Protection showings.

Regarding protection of international concerns, the facility is and will remain within 320 km from the common border between the United States and Canada. However full protection will be afforded all Canadian concerns as noted in **Exhibit 6**.

ENVIRONMENTAL COMPLIANCE SHOWINGS: The proposed facility complies with the maximum permissible radiofrequency electromagnetic exposure limits for controlled and uncontrolled environments as set forth under §1.1310 and/or §1.1307(b)(3) of the Commission's rules and the guidelines for RF radiation protection guidelines as set forth in OET Bulletin No. 65 (Edition 97-01), and the accompanying Supplement A, (Edition 97-01). Compliance has been demonstrated in the attached **RF Appendix 1** of this filing. The facility is, or will be, properly marked with signs. Entry is, or will be, restricted by means of fencing, locked doors or gates. In addition, coordination with other users of the site will be secured to reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency electromagnetic fields in excess of FCC guidelines.

Regarding compliance with the NEPA, Nationwide Programmatic Agreement and NHPA Section 106 for tower co-location, compliance with the Agreement is not required where no new tower construction is being proposed and the tower is not being substantially altered. Specifically, compliance is not necessary where only an antenna and feed-line are being added to an existing structure, as here. However, should the Commission determine compliance is necessary, upon notification to the applicant, the applicant will file FCC Form 621.

CERTIFICATION OF TECHNICAL CONSULTANT: *I declare, under penalty of perjury, that the contents of this report are true and accurate to the best of my knowledge and belief. I further certify I have over twenty-one years of experience as a broadcast technical consultant before the Federal Communications Commission ("the FCC"); and am familiar with the Code of Federal Regulations Title 47 ("the Rules") as pertaining to this report and its contents herein. The underlying data utilized in this report was taken directly from FCC databases or indirectly through third party software vendors securing data directly from FCC databases. This firm cannot be held liable for errors or omissions resulting from the underlying data. The information contained herein is believed accurate to the date reported below.*


Justin W. Asher, Technical Consultant

February 11, 2021

Exhibit 1
Service Contour Study:
Present vs Proposed Operations

W260CF.L
Manchester, NH
BLFT20151105AJJ
Facility ID: 154234
Latitude: 42-59-02.30 N
Longitude: 071-35-20.20 W
ERP: 0.11 kW
Channel: 260D (99.9 MHz)
AMSL Height: 411.0 m
Pattern: Directional

60 dBμ F(50:50) Contour
Total Population: 141,855
Total Area: 295.5 sq. km

W260CF.P
Manchester, NH
Proposed Operation
Facility ID: 154234
Latitude: 42-54-26.90 N
Longitude: 071-27-40.90 W
ERP: 0.11 kW
Channel: 260D (99.9 MHz)
AMSL Height: 157.3 m
Pattern: Directional

60 dBμ F(50:50) Contour
Total Population: 98,560
Total Area: 228.8 sq. km

NED 03 SEC Terrain Database
US Census 2010 PL Database
NAD 1983 Coordinate Datum

Terrain
0 423 m

Scale 1:185,000
0 3 6 9 km

Licensed 60 dBμ F(50:50) Contour

Proposed 60 dBμ F(50:50) Contour

+
W260CF.L

+
W260CF.P

Exhibit 2
Service Contour Study:
Proposed vs Primary Operations

25 mile Radius from AM Site

Primary 2 mV/m Daytime Contour

Proposed 60 dBμ F(50:50) Contour

W260CF.P
WFEA(AM)

WFEA(AM) - 1370 kHz
Manchester, New Hampshire
DA2: Directional Antenna
Station Class: B
Region 2 Class: B
Facility ID: 58543
File Number: BML-20110330AYO
42-54-26.0 N 71-27-45.0 W (NAD 27)
42-54-26.3 N 71-27-43.2 W (NAD 83)
Power: 5 kW, Directional
Hours: Daytime
Pattern Type: Standard
Towers: 2 Augmentations: 0
RMS Theoretical: 750.44 mV/meter
RMS Standard: 788.31 mV/meter

W260CF.P
Manchester, NH
Proposed Operation
Facility ID: 154234
Latitude: 42-54-26.90 N
Longitude: 071-27-40.90 W
ERP: 0.11 kW
Channel: 260D (99.9 MHz)
AMSL Height: 157.3 m
Pattern: Directional

NED 03 SEC Terrain Database
US Census 2010 PL Database
NAD 1983 Coordinate Datum

Scale 1:475,000
0 6 12 18 km

Asher Broadcast Consulting LLC
justinasher@consultant.com
1 (202) 875-2986

Exhibit 3

Copy of Existing Antenna Structure Registration

(public record copy)

Registration Detail

Reg Number	1218378	Status	Constructed
File Number	A0452804	Constructed	10/23/2001
EMI	No	Dismantled	
NEPA	No		

Antenna Structure

Structure Type 2TA1 - Antenna Tower Array - 1st N = # towers 2nd N =

Location (in NAD83 Coordinates)

Lat/Long	42-54-26.9 N 071-27-40.9 W	Address	East Tower - 754 Daniel Webster Hwy
City, State	Merrimack , NH		
Zip	03054	County	HILLSBOROUGH
Center of AM Array	42-54-26.3 N 071-27-43.2 W	Position of Tower in Array	

Heights (meters)

Elevation of Site Above Mean Sea Level	Overall Height Above Ground (AGL)
56.7	109.4
Overall Height Above Mean Sea Level	Overall Height Above Ground w/o Appurtenances
166.1	109.4

Painting and Lighting Specifications

FCC Paragraphs 1, 3, 12, 21

FAA Notification

FAA Study	00-ANE-0528-OE	FAA Issue Date	09/12/2000
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Owner & Contact Information

FRN	0009269424	Owner Entity Type	
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Owner

Saga Communications of New England, LLC	P: (313)886-7070
Attention To: Gregory Urbiel	F:
73 Kercheval Avenue, Suite 201	E: gurbiel@sagacom.com
Grosse Pointe Farms , MI 48236	

Contact

Smithwick , Gary S Esq	P: (202)363-4560
5028 Wisconsin Avenue NW, Suite 301	F:
Washington , DC 20016	E: gsmithwick@fccworld.com

Last Action Status

Status	Constructed	Received	06/22/2005
Purpose	Admin Update	Entered	06/22/2005
Mode	Interactive		

Related Applications

06/22/2005	A0452804 - Admin Update (AU)
12/05/2003	A0357099 - Change Owner (OC)
10/23/2001	A0219042 - Notification (NT)

Related applications (4)

Comments

Comments

None

History

Date	Event
08/27/2010	Registration Printed
08/26/2010	Duplicate Registration Request Received
08/26/2010	Supersede - Internal Correction Applied

All History (14)

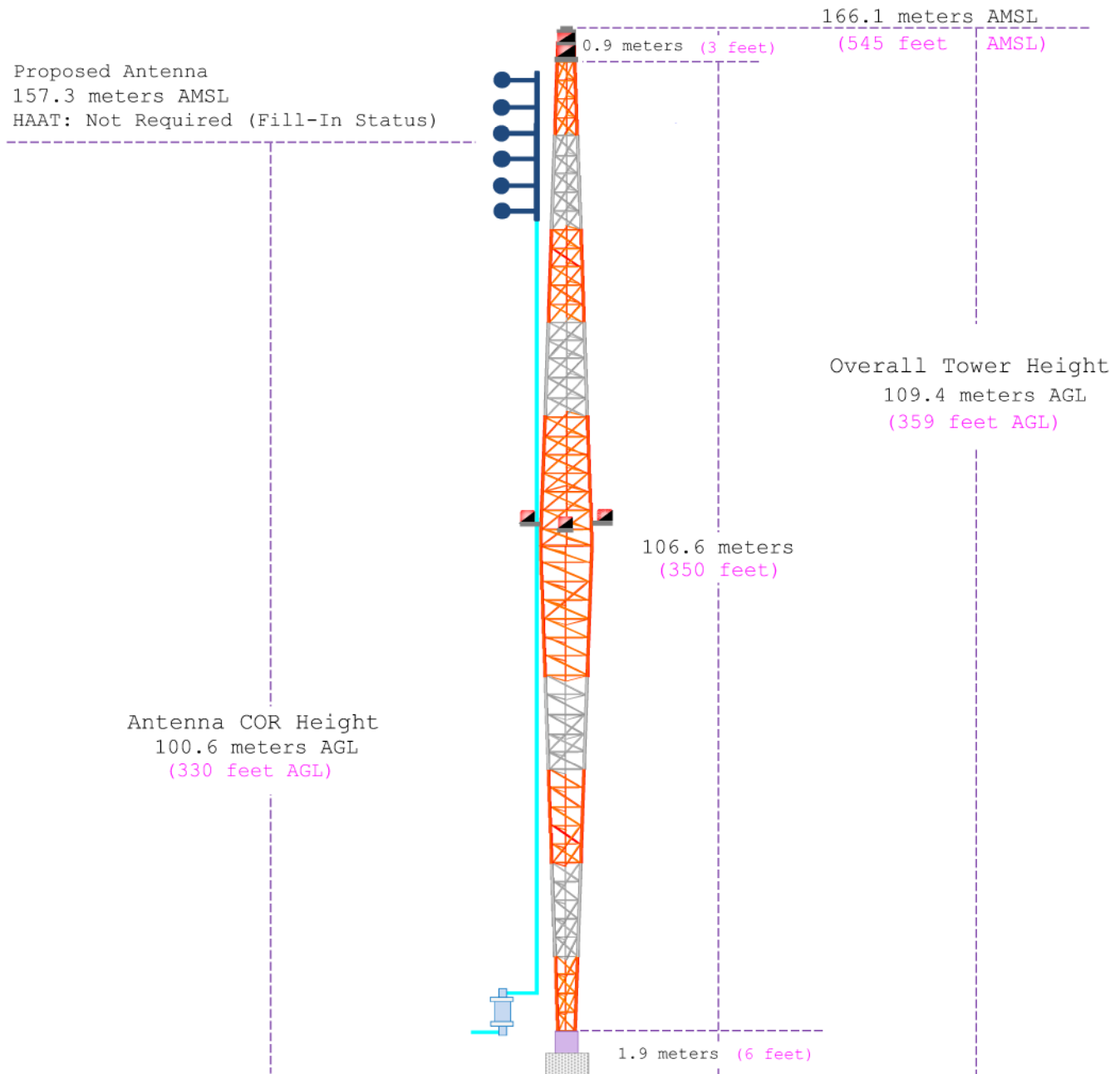
Automated Letters

08/27/2010	Authorization, Reference
06/23/2005	Authorization, Reference 432480
12/08/2003	Ownership Change, Reference 314030

All letters (6)

Exhibit 4

Vertical Plan of Antenna System



Ground Elevation: 56.7 meters AMSL (186 feet AMSL)		
Address: East Tower - 754 Daniel Webster Hwy		
City: Merrimack	Latitude (D M S) Longitude (D M S)	
County: Hillsborough	--- --- (NAD 1927)	
State: New Hampshire	Lat/Long 42-54-26.9 N 71-27-40.9 W (NAD 1983)	
Antenna Structure Registration 1218378	Drawing Is Not To Scale	Asher Broadcast Consulting, LLC justinasher@consultant.com 1(202)875-2986

Exhibit 5

HAAT and Miscellaneous Coordinate Information

HAAT Calculation (NAD 1983):

N. Lat. = 425426.9 W. Lng. = 712740.9
 HAAT and Distance to Contour,
 FCC, FM 2-10 Mi, 51 pts Method - NED 03 SEC

Azi.	AV EL	HAAT	ERP kW	dBk	Field	60-F5
000	76.6	80.7	0.1100	-9.59	1.000	9.51
030	78.9	78.4	0.1100	-9.59	1.000	9.38
060	98.5	58.8	0.1100	-9.59	1.000	8.12
090	106.2	51.1	0.1100	-9.59	1.000	7.51
120	102.8	54.5	0.0704	-11.52	0.800	6.94
150	82.1	75.2	0.1100	-9.59	1.000	9.19
180	51.8	105.5	0.1100	-9.59	1.000	10.83
210	65.6	91.7	0.1100	-9.59	1.000	10.13
240	78.1	79.2	0.1100	-9.59	1.000	9.42
270	114.6	42.7	0.1100	-9.59	1.000	6.82
300	143.9	13.4	0.1100	-9.59	1.000	5.77
330	84.6	72.7	0.1100	-9.59	1.000	9.03

Ave El= 90.33 M HAAT= 66.97 M AMSL= 157.3

NAD 1983 to NAD 1927 Conversion:

Various Coordinate Conversion Calculations (NAD 1983):

Position Type	Lat Lon
Degrees Lat Long	42.9074722°, -071.4613611°
Degrees Minutes	42°54.44833', -071°27.68167'
Degrees Minutes Seconds	42°54'26.9000", -071°27'40.9000"
UTM	19T 299073mE 4753479mN
UTM centimeter	19T 299073.12mE 4753479.03mN
MGRS	19TBH9907353479
Grid North	-1.7°
GARS	218MB14
Maidenhead	FN42GV47PT20
GEOREF	HJDN32315444

Exhibit 6

Tabulation of Proposed Allocation

Concerning W253AF - Nashua, NH (Facility ID: 83187), former pending application BMPFT-20180221AAB and granted permit BMPFT-20170713AHQ are believed to no longer require protection. Pending application BMPFT-20180221AAB was dismissed on 05/26/2020, via FCC Letter (Reference: 1800B3-KV). Granted construction permit BMPFT-20170713AHQ expired on 11/30/2019, subsequent to the 05/26/2020 dismissal of pending license application BLFT-20171221AAJ and revocation of underlying license BLFT-19980824TA (W253AF - Bennington, VT) via the same FCC Letter (Reference: 1800B3-KV). The 05/26/2020 FCC Letter (Reference: 1800B3 KV) is a matter of record before the Commission. It should be noted an outstanding 06/29/2020 *Petition for Reconsideration* has been filed by Absolute Broadcasting, LLC, to reinstate the W253AF filings. However, at present, pending application BMPFT-20180221AAB remains listed as "dismissed" within the CDBS/LMS databases. Likewise, granted construction permit BMPFT-20170713AHQ remains expired as of 11/30/2019. The applicant is not opposed to a grant of this instant application conditioned on the outcome of the outstanding 06/29/2020 *Petition for Reconsideration*.

Yellow Text denotes the existence of a 47 C.F.R. Section 74.1204(d) Second/Third Adjacent Channel Given Interference Waiver Request as included in *Exhibit(s) 8(a-b)*.

Saga Communications Of New England, LLC											
REFERENCE	CH#	260D	-	99.9 MHz,	Pwr= 0.11 kW DA,	HAAT= 67.0 M,	COR= 157.3 M	DISPLAY DATES			
42 54 26.90 N.				Average Protected F(50-50)= 8.67 km				DATA	01-08-21		
71 27 40.90 W.				Standard Directional				SEARCH	01-10-21		
CH	CALL	TYPE	ANT	AZI	DIST	LAT	PWR(kW)	INT(km)	PRO(km)	*IN*	*OUT*
CITY		STATE	<--	FILE #		LNG	HAAT (M)	COR (M)	LICENSEE	(Overlap	in km)
258B WCRB	LIC_CN	144.6	34.53	42 39 14.30	27.000	5.6	63.5	20.0	-30.4*<		
Lowell	MA	324.8	BLH19990310KE	71 13 00.20	199	238	Wgbh Educational Foundatio				
260D W253AF	APP DVN	184.3	16.49	42 45 34.30	0.250	10.9	3.4	-5.2<	-23.5*<		
Nashua	NH	4.3	BMPFT20180221AAB	71 28 35.20		96	Absolute Broadcasting, LLC				
260D W253AF	CP DVN	184.3	16.49	42 45 34.30	0.250	10.9	3.4	-5.2<	-23.5*<		
Nashua	NH	4.3	BMPFT20170713AHQ	71 28 35.20		96	Absolute Broadcasting, LLC				
260D W260CF	LIC DCN	309.4	13.42	42 59 02.30	0.110		---Reference---				
Manchester	NH	129.3	BLFT20151105AJJ	71 35 20.20		411	Saga Communications Of New				
260A WKMY	LIC_CN	240.2	69.63	42 35 39.30	1.850	69.9	22.3	-9.6*<	16.0		
Athol	MA	59.7	BLH19891204KC	72 12 00.20	124	396	Educational Media Foundati				
260A WKMY	LIC_CN	240.2	69.63	42 35 39.30	1.850	69.9	22.3	-9.6*<	16.0		
Athol	MA	59.7	0000105606	72 12 00.20	124	396	Educational Media Foundati				
262B WHEB	LIC_CN	73.8	58.73	43 03 11.30	50.000	5.6	62.3	46.7	-5.0*<		
Portsmouth	NH	254.2	BLH19910307KE	70 46 02.10	140	151	Capstar Tx, LLC				
260D W260AS	LIC_CN	116.7	33.04	42 46 23.30	0.010	23.2	6.9	2.3	1.0		
Lawrence	MA	297.0	BLFT20090304ABF	71 05 59.20	163	205	Educational Media Foundati				
260B WTHT	LIC_CN	38.6	149.48	43 57 07.30	28.500	130.5	64.2	9.5	39.3		
Auburn	ME	219.4	BLH19980825KD	70 17 44.20	196	288	Wbin Media Co., Inc.				
260L1 WQEB-LP	LIC_CN	156.8	49.57	42 29 50.50	0.100		23.5R	26.1M			
Winchester	MA	336.9	BLL20180102AAX	71 13 22.30	19	63	Winchester School Of Chine				
260B WQRC	LIC_CN	145.5	163.60	41 41 19.30	50.000	134.2	61.3	20.5	58.9		
Barnstable	MA	326.3	BLH19820607AO	70 20 47.00	116	125	Sandab Commun. Ltd. Partne				
206B WEVO	LIC_CN	345.1	35.35	43 12 53.30	50.000	107.6	39.6	14.5R	20.9M		
Concord	NH	165.0	BMLE20100630BSW	71 34 26.30	116	251	New Hampshire Public Radio				
259A WNTK-FM	LIC ZCN	322.5	75.97	43 26 54.30	1.450	41.4	27.4	28.3	39.7		
New London	NH	142.1	BMLH20161013AAW	72 02 02.30	206	582	Sugar River Media, LLC				
261A WWFX	LIC ZCN	204.5	83.32	42 13 28.30	2.850	41.8	27.5	30.9	40.8		
Southbridge	MA	24.2	BLH19990209KB	71 52 49.30	146	359	Radio License Holding Cbc,				

Terrain database is NED 03 SEC , R= 73.215 qualifying spacings or FCC minimum Spacings in KM, M= Margin in KM
 Contour distances are on direct line to and from reference station. Reference zone= East Zone, Co to 3rd adjacent.
 All separation margins (if shown) include rounding.
 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.
 < = Station meets FCC minimum distance spacing for its class.
 < = Contour Overlap
 Reference station has protected zone issue: AM tower

Exhibit 7a

Contour Protection Studies Toward Select Allocation Concern(s)

Saga Communications Of New England, LLC

FMCommander Single Allocation Study - 01-10-2021 - NED 03 SEC
W260CF.P's Overlaps (In= -9.64 km, Out= 16.04 km)

W260CF.P CH 260 D DA
Lat= 42 54 26.90, Lng= 71 27 40.90
0.11 kW 67 m HAAT, 157.3 m COR
Prot.= 60 dBu, Intef.= 40 dBu

WKMY CH 260 A 0000105606
Lat= 42 35 39.30, Lng= 72 12 00.20
1.85 kW 124 m HAAT, 396 m COR
Prot.= 60 dBu, Intef.= 40 dBu

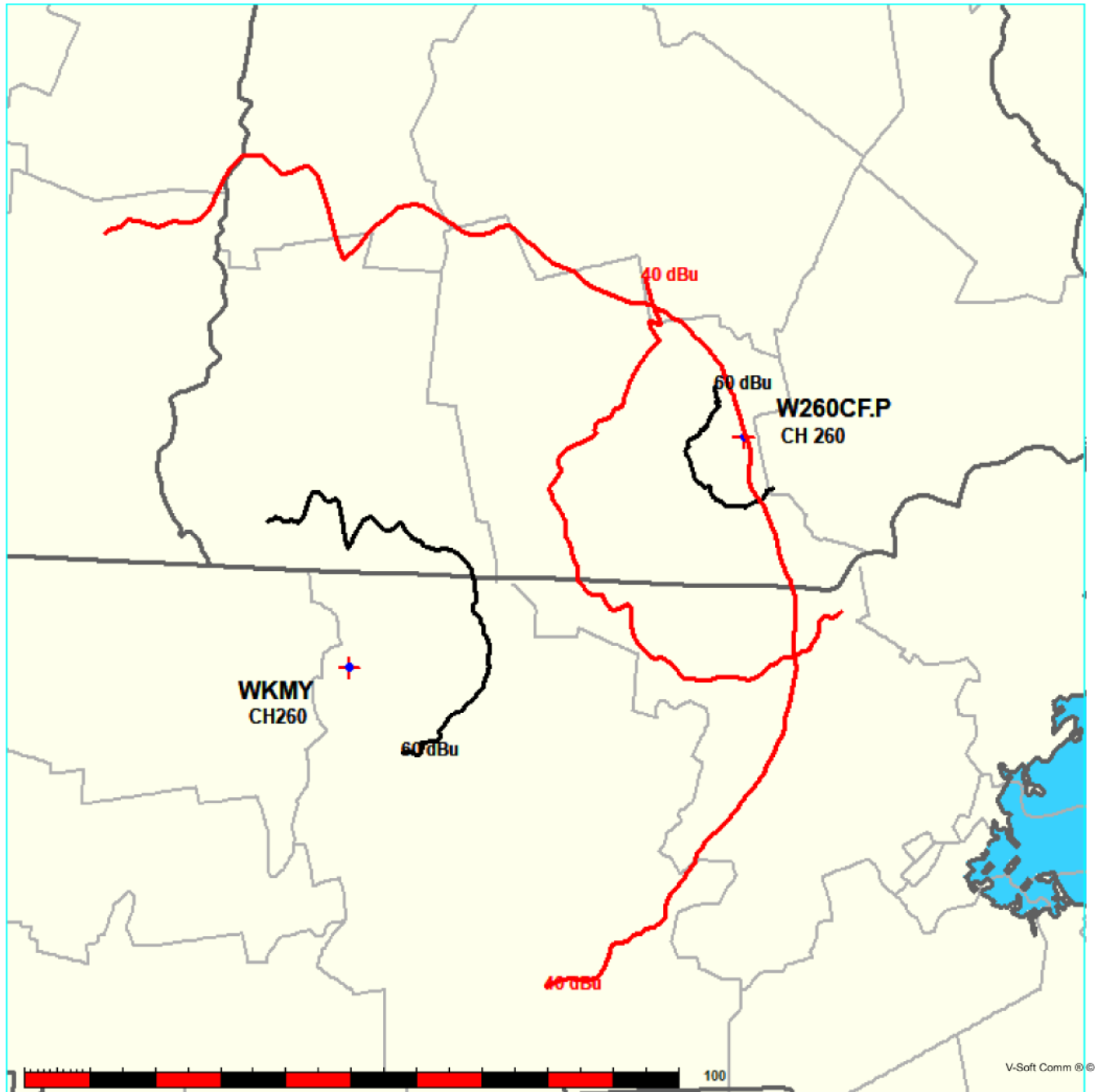


Exhibit 7a

Contour Protection Studies Toward Select Allocation Concern(s)

01-10-2021

Terrain Data: NED 03 SEC

FMOver Analysis

W260CF.P

WKMY 0000105606

Channel = 260D
 Max ERP = 0.11 kW
 RCAMSL = 157.3 m
 N. Lat. 42 54 26.90
 W. Lng. 71 27 40.90
 Protected
 60 dBu

Channel = 260A
 Max ERP = 1.85 kW
 RCAMSL = 396 m
 N. Lat. 42 35 39.30
 W. Lng. 72 12 00.20
 Interfering
 40 dBu

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)	IX (km)
200.0	000.1100	0100.5	010.6	066.1	001.8500	0091.7	061.9	41.55*	5.10
201.0	000.1100	0100.2	010.6	066.0	001.8500	0091.7	061.8	41.59*	5.21
202.0	000.1100	0102.2	010.7	065.9	001.8500	0091.8	061.6	41.66*	5.42
203.0	000.1100	0102.2	010.7	065.8	001.8500	0091.9	061.5	41.71*	5.58
204.0	000.1100	0101.2	010.6	065.6	001.8500	0092.1	061.4	41.75*	5.71
205.0	000.1100	0099.9	010.5	065.4	001.8500	0092.2	061.3	41.78*	5.80
206.0	000.1100	0099.2	010.5	065.3	001.8500	0092.3	061.2	41.82*	5.93
207.0	000.1100	0098.6	010.5	065.1	001.8500	0092.5	061.1	41.86*	6.05
208.0	000.1100	0096.4	010.4	064.9	001.8500	0092.7	061.1	41.88*	6.11
209.0	000.1100	0094.7	010.3	064.8	001.8500	0093.0	061.1	41.92*	6.21
210.0	000.1100	0091.7	010.1	064.5	001.8500	0093.6	061.1	41.95*	6.30
211.0	000.1100	0088.6	010.0	064.3	001.8500	0094.3	061.1	41.98*	6.41
212.0	000.1100	0085.3	009.8	064.1	001.8500	0095.2	061.2	42.02*	6.54
213.0	000.1100	0082.0	009.6	063.9	001.8500	0096.0	061.3	42.06*	6.64
214.0	000.1100	0078.4	009.4	063.6	001.8500	0096.8	061.4	42.07*	6.69
215.0	000.1100	0078.3	009.4	063.5	001.8500	0097.2	061.3	42.13*	6.86
216.0	000.1100	0082.0	009.6	063.4	001.8500	0097.4	061.0	42.23*	7.17
217.0	000.1100	0086.4	009.8	063.4	001.8500	0097.6	060.7	42.34*	7.49
218.0	000.1100	0087.2	009.9	063.3	001.8500	0098.2	060.6	42.42*	7.73
219.0	000.1100	0087.0	009.9	063.1	001.8500	0098.9	060.5	42.49*	7.94
220.0	000.1100	0085.6	009.8	063.0	001.8500	0099.9	060.5	42.55*	8.12
221.0	000.1100	0085.5	009.8	062.8	001.8500	0100.5	060.5	42.61*	8.30
222.0	000.1100	0084.0	009.7	062.6	001.8500	0101.1	060.5	42.65*	8.40
223.0	000.1100	0085.5	009.8	062.5	001.8500	0101.7	060.4	42.73*	8.65
224.0	000.1100	0087.6	009.9	062.4	001.8500	0102.2	060.2	42.83*	8.92
225.0	000.1100	0088.6	010.0	062.2	001.8500	0102.7	060.1	42.90*	9.13
226.0	000.1100	0088.5	010.0	062.1	001.8500	0103.4	060.0	42.96*	9.31
227.0	000.1100	0088.7	010.0	061.9	001.8500	0103.9	060.0	43.01*	9.46
228.0	000.1100	0089.0	010.0	061.8	001.8500	0104.4	059.9	43.06*	9.60
229.0	000.1100	0089.2	010.0	061.6	001.8500	0104.7	059.9	43.10*	9.72
230.0	000.1100	0088.4	010.0	061.4	001.8500	0105.0	059.9	43.12*	9.77

Exhibit 7a

Contour Protection Studies Toward Select Allocation Concern(s)

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)
231.0	000.1100	0086.0	009.8	061.3	001.8500	0105.3	060.0	43.11* 9.73
232.0	000.1100	0083.8	009.7	061.1	001.8500	0105.5	060.1	43.09* 9.68
233.0	000.1100	0083.5	009.7	060.9	001.8500	0105.6	060.1	43.09* 9.70
234.0	000.1100	0082.5	009.6	060.7	001.8500	0105.5	060.1	43.07* 9.65
235.0	000.1100	0081.7	009.6	060.6	001.8500	0105.5	060.1	43.06* 9.62
236.0	000.1100	0080.8	009.5	060.4	001.8500	0105.5	060.1	43.05* 9.59
237.0	000.1100	0080.1	009.5	060.3	001.8500	0105.6	060.2	43.05* 9.57
238.0	000.1100	0079.1	009.4	060.1	001.8500	0105.8	060.2	43.04* 9.55
239.0	000.1100	0078.5	009.4	059.9	001.8500	0106.0	060.3	43.04* 9.56
240.0	000.1100	0079.2	009.4	059.8	001.8500	0106.2	060.2	43.07* 9.64
241.0	000.1100	0078.2	009.4	059.6	001.8500	0106.3	060.3	43.06* 9.60
242.0	000.1100	0077.0	009.3	059.5	001.8500	0106.4	060.3	43.04* 9.55
243.0	000.1100	0076.0	009.2	059.3	001.8500	0106.5	060.4	43.02* 9.50
244.0	000.1100	0074.7	009.2	059.2	001.8500	0106.7	060.5	43.00* 9.45
245.0	000.1100	0074.1	009.1	059.0	001.8500	0107.0	060.6	43.00* 9.46
246.0	000.1100	0074.5	009.1	058.9	001.8500	0107.4	060.5	43.03* 9.54
247.0	000.1100	0074.0	009.1	058.7	001.8500	0107.8	060.6	43.03* 9.55
248.0	000.1100	0074.7	009.2	058.6	001.8500	0108.3	060.6	43.07* 9.66
249.0	000.1100	0075.3	009.2	058.4	001.8500	0108.8	060.6	43.11* 9.77
250.0	000.1100	0075.3	009.2	058.3	001.8500	0109.1	060.6	43.12* 9.79
251.0	000.1100	0076.8	009.3	058.1	001.8500	0109.3	060.5	43.15* 9.88
252.0	000.1100	0077.1	009.3	058.0	001.8500	0109.5	060.6	43.15* 9.90
253.0	000.1100	0076.6	009.3	057.8	001.8500	0109.7	060.6	43.14* 9.86
254.0	000.1100	0076.3	009.3	057.7	001.8500	0109.9	060.7	43.13* 9.84
255.0	000.1100	0076.6	009.3	057.5	001.8500	0110.2	060.7	43.14* 9.87
256.0	000.1100	0074.3	009.1	057.4	001.8500	0110.5	060.9	43.09* 9.74
257.0	000.1100	0071.2	008.9	057.3	001.8500	0110.7	061.1	43.02* 9.53
258.0	000.1100	0068.4	008.8	057.2	001.8500	0110.8	061.4	42.96* 9.35
259.0	000.1100	0066.0	008.6	057.2	001.8500	0111.0	061.6	42.90* 9.18
260.0	000.1100	0066.0	008.6	057.0	001.8500	0111.2	061.6	42.89* 9.15
261.0	000.1100	0067.9	008.7	056.9	001.8500	0111.4	061.6	42.92* 9.25
262.0	000.1100	0067.5	008.7	056.7	001.8500	0111.5	061.6	42.90* 9.18
263.0	000.1100	0066.3	008.6	056.7	001.8500	0111.7	061.8	42.86* 9.07
264.0	000.1100	0064.5	008.5	056.6	001.8500	0111.8	061.9	42.81* 8.92
265.0	000.1100	0061.5	008.3	056.5	001.8500	0111.8	062.2	42.72* 8.68
266.0	000.1100	0058.5	008.1	056.5	001.8500	0111.9	062.4	42.64* 8.44
267.0	000.1100	0054.1	007.8	056.6	001.8500	0111.8	062.8	42.52* 8.06
268.0	000.1100	0049.4	007.4	056.6	001.8500	0111.7	063.2	42.38* 7.65
269.0	000.1100	0046.1	007.1	056.7	001.8500	0111.6	063.5	42.28* 7.35
270.0	000.1100	0042.7	006.8	056.7	001.8500	0111.6	063.8	42.18* 7.03
271.0	000.1100	0041.2	006.7	056.7	001.8500	0111.6	064.0	42.13* 6.87
272.0	000.1100	0042.4	006.8	056.5	001.8500	0111.8	064.0	42.14* 6.92
273.0	000.1100	0042.4	006.8	056.5	001.8500	0112.0	064.0	42.13* 6.88
274.0	000.1100	0042.4	006.8	056.4	001.8500	0112.1	064.1	42.11* 6.84
275.0	000.1100	0041.8	006.8	056.3	001.8500	0112.2	064.2	42.08* 6.73

Exhibit 7a

Contour Protection Studies Toward Select Allocation Concern(s)

01-10-2021 Terrain Data: NED 03 SEC FMOver Analysis

WKMY 0000105606

W260CF.P

Channel = 260A
 Max ERP = 1.85 kW
 RCAMSL = 396 m
 N. Lat. 42 35 39.30
 W. Lng. 72 12 00.20
 Protected
 60 dBu

Channel = 260D
 Max ERP = 0.11 kW
 RCAMSL = 157.3 m
 N. Lat. 42 54 26.90
 W. Lng. 71 27 40.90
 Interfering
 40 dBu

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)	IX (km)
015.0	001.8500	0095.0	021.1	255.5	000.1100	0075.8	056.6	29.91	
016.0	001.8500	0095.2	021.1	255.3	000.1100	0076.1	056.3	30.05	
017.0	001.8500	0096.6	021.3	255.2	000.1100	0076.2	055.9	30.19	
018.0	001.8500	0100.2	021.7	255.4	000.1100	0076.0	055.4	30.35	
019.0	001.8500	0107.7	022.5	255.8	000.1100	0074.9	054.6	30.52	
020.0	001.8500	0111.8	022.9	255.9	000.1100	0074.5	054.1	30.68	
021.0	001.8500	0109.7	022.7	255.5	000.1100	0075.6	053.9	30.84	
022.0	001.8500	0106.4	022.3	255.0	000.1100	0076.7	053.8	30.97	
023.0	001.8500	0104.2	022.1	254.5	000.1100	0076.6	053.6	31.02	
024.0	001.8500	0103.1	022.0	254.2	000.1100	0076.3	053.4	31.08	
025.0	001.8500	0100.8	021.7	253.7	000.1100	0076.3	053.2	31.12	
026.0	001.8500	0098.8	021.5	253.3	000.1100	0076.4	053.1	31.18	
027.0	001.8500	0098.3	021.5	252.9	000.1100	0076.6	052.9	31.28	
028.0	001.8500	0098.6	021.5	252.7	000.1100	0076.9	052.6	31.40	
029.0	001.8500	0099.3	021.6	252.4	000.1100	0077.1	052.3	31.53	
030.0	001.8500	0100.2	021.7	252.2	000.1100	0077.2	051.9	31.65	
031.0	001.8500	0098.0	021.4	251.7	000.1100	0077.0	051.9	31.66	
032.0	001.8500	0096.9	021.3	251.3	000.1100	0076.8	051.7	31.69	
033.0	001.8500	0097.1	021.3	251.0	000.1100	0076.8	051.5	31.77	
034.0	001.8500	0098.4	021.5	250.8	000.1100	0076.6	051.1	31.88	
035.0	001.8500	0099.7	021.6	250.5	000.1100	0076.3	050.8	31.96	
036.0	001.8500	0101.4	021.8	250.3	000.1100	0075.9	050.4	32.05	
037.0	001.8500	0102.9	022.0	250.0	000.1100	0075.4	050.1	32.13	
038.0	001.8500	0105.7	022.3	249.8	000.1100	0075.2	049.7	32.26	
039.0	001.8500	0110.8	022.8	249.7	000.1100	0075.2	049.0	32.48	
040.0	001.8500	0114.0	023.1	249.5	000.1100	0075.2	048.6	32.63	
041.0	001.8500	0116.2	023.3	249.2	000.1100	0075.4	048.2	32.78	
042.0	001.8500	0117.8	023.4	248.8	000.1100	0075.3	047.9	32.87	
043.0	001.8500	0118.8	023.5	248.4	000.1100	0075.0	047.6	32.93	

Exhibit 7a

Contour Protection Studies Toward Select Allocation Concern(s)

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)
044.0	001.8500	0120.7	023.6	248.0	000.1100	0074.8	047.3	33.01
045.0	001.8500	0122.1	023.7	247.6	000.1100	0074.3	047.1	33.06
046.0	001.8500	0121.8	023.7	247.1	000.1100	0073.9	046.9	33.07
047.0	001.8500	0121.9	023.7	246.7	000.1100	0074.3	046.8	33.15
048.0	001.8500	0122.5	023.8	246.2	000.1100	0074.5	046.6	33.24
049.0	001.8500	0122.3	023.8	245.7	000.1100	0074.3	046.5	33.26
050.0	001.8500	0122.2	023.8	245.2	000.1100	0074.2	046.4	33.28
051.0	001.8500	0122.9	023.8	244.7	000.1100	0074.1	046.2	33.33
052.0	001.8500	0120.9	023.7	244.2	000.1100	0074.5	046.3	33.34
053.0	001.8500	0117.6	023.4	243.6	000.1100	0075.2	046.5	33.34
054.0	001.8500	0115.8	023.2	243.1	000.1100	0075.9	046.6	33.39
055.0	001.8500	0115.4	023.2	242.6	000.1100	0076.3	046.6	33.43
056.0	001.8500	0112.8	023.0	242.1	000.1100	0077.0	046.8	33.43
057.0	001.8500	0111.2	022.8	241.6	000.1100	0077.3	046.9	33.41
058.0	001.8500	0109.4	022.6	241.1	000.1100	0078.0	047.0	33.43
059.0	001.8500	0107.1	022.4	240.6	000.1100	0078.6	047.2	33.41
060.0	001.8500	0105.9	022.3	240.1	000.1100	0079.1	047.4	33.42
061.0	001.8500	0105.6	022.2	239.7	000.1100	0079.1	047.4	33.41
062.0	001.8500	0103.7	022.1	239.2	000.1100	0078.8	047.6	33.30
063.0	001.8500	0099.6	021.6	238.8	000.1100	0078.6	048.1	33.12
064.0	001.8500	0095.5	021.2	238.4	000.1100	0078.8	048.6	32.98
065.0	001.8500	0092.6	020.8	238.0	000.1100	0079.1	048.9	32.87
066.0	001.8500	0091.7	020.7	237.6	000.1100	0079.4	049.1	32.85
067.0	001.8500	0092.1	020.8	237.2	000.1100	0079.7	049.1	32.87
068.0	001.8500	0093.4	020.9	236.7	000.1100	0080.5	049.0	32.97
069.0	001.8500	0095.6	021.2	236.3	000.1100	0080.8	048.9	33.05
070.0	001.8500	0096.1	021.2	235.8	000.1100	0080.9	048.9	33.06
071.0	001.8500	0096.2	021.2	235.4	000.1100	0081.3	049.0	33.06
072.0	001.8500	0095.8	021.2	235.0	000.1100	0081.7	049.1	33.04
073.0	001.8500	0097.4	021.4	234.5	000.1100	0082.2	049.1	33.11
074.0	001.8500	0096.3	021.2	234.2	000.1100	0082.4	049.3	33.04
075.0	001.8500	0095.8	021.2	233.8	000.1100	0082.6	049.5	32.99
076.0	001.8500	0096.1	021.2	233.4	000.1100	0082.9	049.6	32.97
077.0	001.8500	0096.4	021.3	233.0	000.1100	0083.5	049.7	32.99
078.0	001.8500	0098.0	021.4	232.5	000.1100	0083.9	049.7	33.02
079.0	001.8500	0099.3	021.6	232.0	000.1100	0083.8	049.8	33.00
080.0	001.8500	0100.0	021.7	231.6	000.1100	0084.2	049.9	32.99
081.0	001.8500	0100.8	021.7	231.2	000.1100	0085.4	050.0	33.06
082.0	001.8500	0101.0	021.8	230.8	000.1100	0086.6	050.2	33.10
083.0	001.8500	0100.1	021.7	230.5	000.1100	0087.4	050.5	33.06
084.0	001.8500	0099.4	021.6	230.2	000.1100	0088.1	050.7	33.02
085.0	001.8500	0098.6	021.5	229.9	000.1100	0088.6	051.0	32.96
086.0	001.8500	0097.3	021.4	229.6	000.1100	0088.8	051.4	32.85
087.0	001.8500	0096.9	021.3	229.3	000.1100	0089.1	051.6	32.78
088.0	001.8500	0095.8	021.2	229.1	000.1100	0089.2	051.9	32.67

Exhibit 7b

Contour Protection Studies Toward Select Allocation Concern(s)

Saga Communications Of New England, LLC

FMCommander Single Allocation Study - 01-10-2021 - NED 03 SEC

W260CF.P's Overlaps (In= 2.31 km, Out= 0.98 km)

W260CF.P CH 260 D DA

Lat= 42 54 26.90, Lng= 71 27 40.90

0.11 kW 67 m HAAT, 157.3 m COR

Prot.= 60 dBu, Intef.= 40 dBu

W260AS CH 260 D BLFT20090304ABF

Lat= 42 46 23.30, Lng= 71 05 59.20

0.01 kW 163.4 m HAAT, 205 m COR

Prot.= 60 dBu, Intef.= 40 dBu

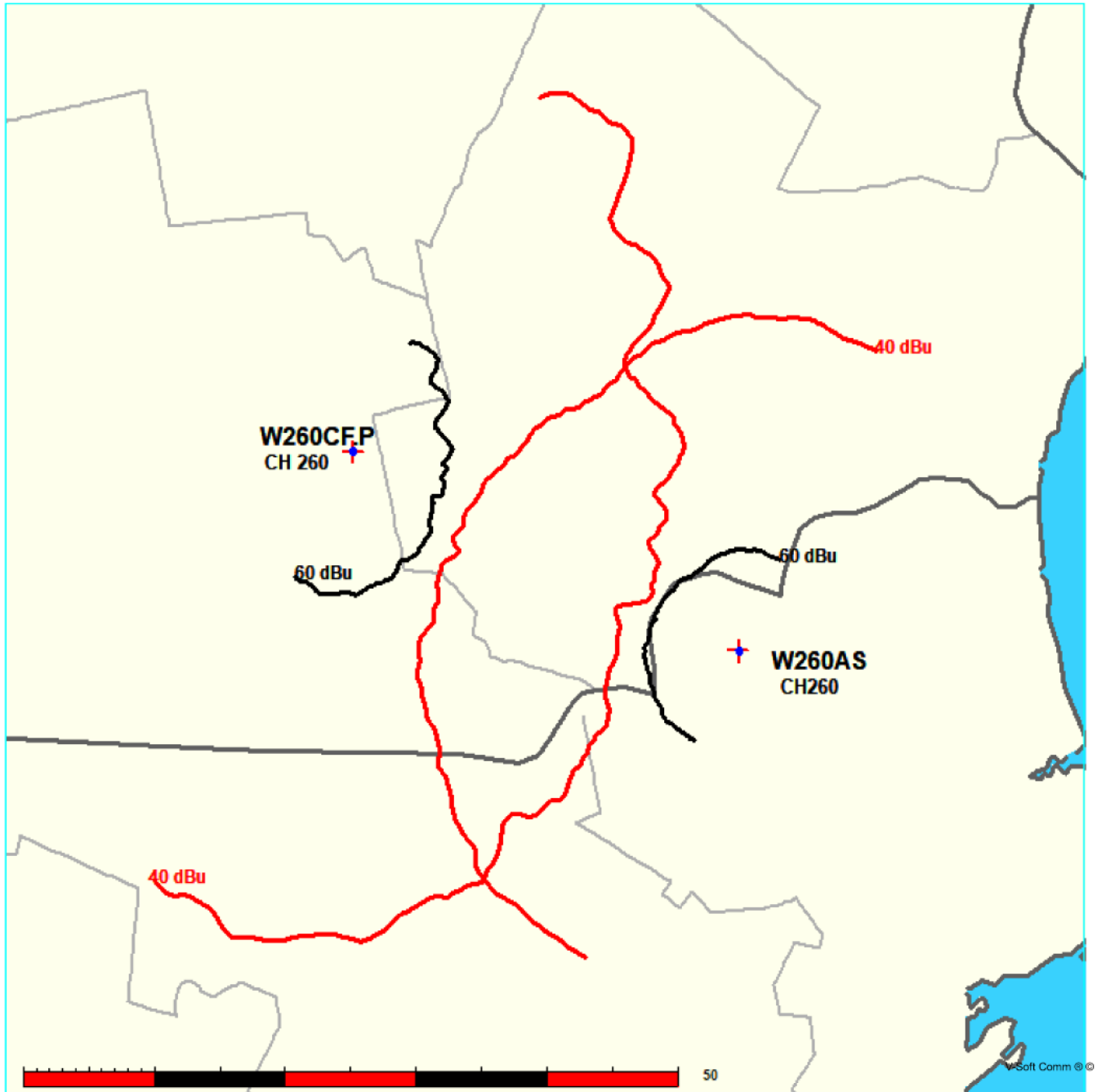


Exhibit 7b

Contour Protection Studies Toward Select Allocation Concern(s)

01-10-2021

Terrain Data: NED 03 SEC

FMOver Analysis

W260CF.P

W260AS BLFT20090304ABF

Channel = 260D

Max ERP = 0.11 kW

RCAMSL = 157.3 m

N. Lat. 42 54 26.90

W. Lng. 71 27 40.90

Protected

60 dBu

Channel = 260D

Max ERP = 0.01 kW

RCAMSL = 205 m

N. Lat. 42 46 23.30

W. Lng. 71 05 59.20

Interfering

40 dBu

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)	IX (km)
075.0	000.1100	0038.8	006.5	305.7	000.0011	0138.9	028.5	26.49	
076.0	000.1100	0040.3	006.6	305.8	000.0011	0138.9	028.4	26.59	
077.0	000.1100	0040.4	006.6	305.6	000.0011	0139.0	028.3	26.66	
078.0	000.1100	0041.3	006.7	305.6	000.0011	0138.9	028.1	26.74	
079.0	000.1100	0042.6	006.8	305.6	000.0011	0138.9	028.0	26.84	
080.0	000.1100	0043.1	006.9	305.5	000.0011	0138.9	027.9	26.91	
081.0	000.1100	0044.3	007.0	305.4	000.0011	0138.9	027.7	27.00	
082.0	000.1100	0045.8	007.1	305.4	000.0011	0138.9	027.5	27.12	
083.0	000.1100	0047.4	007.2	305.4	000.0011	0138.9	027.3	27.24	
084.0	000.1100	0048.8	007.3	305.4	000.0011	0138.8	027.2	27.35	
085.0	000.1100	0048.6	007.3	305.2	000.0011	0139.0	027.1	27.40	
086.0	000.1100	0049.8	007.4	305.1	000.0011	0139.1	026.9	27.51	
087.0	000.1100	0050.8	007.5	305.0	000.0011	0139.1	026.8	27.61	
088.0	000.1100	0051.1	007.5	304.8	000.0011	0139.3	026.7	27.69	
089.0	000.1100	0051.5	007.5	304.6	000.0011	0139.6	026.6	27.78	
090.0	000.1100	0051.1	007.5	304.3	000.0011	0139.9	026.6	27.82	
091.0	000.1100	0050.2	007.4	304.0	000.0011	0140.3	026.5	27.86	
092.0	000.1100	0049.7	007.4	303.7	000.0011	0140.4	026.5	27.89	
093.0	000.1100	0048.6	007.3	303.4	000.0011	0141.1	026.5	27.93	
094.0	000.1100	0047.9	007.3	303.1	000.0011	0141.5	026.5	27.97	
095.0	000.1100	0047.1	007.2	302.8	000.0011	0142.0	026.5	28.00	
096.0	000.1100	0045.5	007.1	302.4	000.0011	0141.3	026.6	27.91	
097.0	000.1100	0043.8	006.9	302.0	000.0011	0140.9	026.6	27.83	
098.0	000.1100	0043.7	006.9	301.8	000.0011	0140.8	026.6	27.85	
099.0	000.1100	0045.2	007.0	301.6	000.0011	0140.7	026.4	27.95	
100.0	000.1100	0047.3	007.2	301.5	000.0011	0140.6	026.2	28.09	
101.0	000.1100	0048.1	007.3	301.3	000.0011	0140.5	026.1	28.15	
102.0	000.1100	0048.1	007.3	301.1	000.0011	0140.4	026.1	28.18	
103.0	000.1100	0047.7	007.2	300.8	000.0011	0139.8	026.1	28.15	
104.0	000.1100	0046.7	007.2	300.5	000.0011	0139.4	026.1	28.09	
105.0	000.1100	0046.8	007.2	300.2	000.0011	0139.5	026.1	28.13	
106.0	000.1100	0045.7	007.1	299.9	000.0011	0139.8	026.1	28.10	
107.0	000.1100	0045.1	007.0	299.6	000.0011	0140.0	026.1	28.11	

Exhibit 7b
Contour Protection Studies Toward Select Allocation Concern(s)

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)
108.0	000.1100	0046.0	007.1	299.4	000.0011	0140.5	026.1	28.21
109.0	000.1100	0048.3	007.3	299.2	000.0011	0141.0	025.8	28.38
110.0	000.1100	0049.9	007.4	298.9	000.0011	0141.0	025.7	28.49
111.0	000.1056	0050.6	007.4	298.6	000.0011	0141.0	025.7	28.49
112.0	000.1014	0051.8	007.4	298.4	000.0011	0140.8	025.7	28.50
113.0	000.0972	0053.4	007.4	298.1	000.0011	0140.5	025.6	28.52
114.0	000.0931	0054.2	007.4	297.8	000.0011	0140.4	025.6	28.51
115.0	000.0891	0057.3	007.6	297.5	000.0011	0141.0	025.5	28.64
116.0	000.0852	0058.4	007.5	297.2	000.0011	0142.1	025.5	28.71
117.0	000.0814	0058.6	007.5	296.9	000.0011	0142.6	025.6	28.68
118.0	000.0776	0057.7	007.3	296.6	000.0011	0143.1	025.7	28.62
119.0	000.0740	0056.1	007.1	296.4	000.0011	0143.7	025.9	28.53
120.0	000.0704	0054.5	006.9	296.1	000.0011	0144.0	026.1	28.42
121.0	000.0704	0054.9	007.0	295.9	000.0011	0144.1	026.1	28.43
122.0	000.0704	0056.6	007.1	295.6	000.0011	0144.2	026.0	28.50
123.0	000.0704	0059.3	007.2	295.2	000.0011	0143.7	025.9	28.58
124.0	000.0704	0060.1	007.3	295.0	000.0011	0143.0	025.8	28.55
125.0	000.0704	0061.3	007.4	294.6	000.0011	0142.1	025.8	28.53
126.0	000.0704	0063.1	007.4	294.3	000.0011	0141.3	025.7	28.53
127.0	000.0704	0064.4	007.5	294.0	000.0011	0141.0	025.7	28.54
128.0	000.0704	0065.7	007.6	293.7	000.0011	0140.8	025.6	28.56
129.0	000.0704	0066.3	007.6	293.4	000.0011	0141.0	025.6	28.57
130.0	000.0704	0066.4	007.6	293.1	000.0011	0141.4	025.7	28.58
131.0	000.0740	0066.4	007.7	292.7	000.0011	0142.0	025.6	28.66
132.0	000.0776	0066.1	007.8	292.4	000.0011	0142.5	025.6	28.72
133.0	000.0814	0065.9	007.9	292.0	000.0011	0143.4	025.6	28.80
134.0	000.0852	0066.1	008.0	291.6	000.0011	0144.3	025.5	28.89
135.0	000.0891	0069.3	008.3	291.1	000.0011	0144.1	025.3	29.05
136.0	000.0931	0069.6	008.4	290.7	000.0011	0143.3	025.2	29.03
137.0	000.0972	0069.7	008.6	290.2	000.0011	0142.2	025.2	28.98
138.0	000.1014	0068.7	008.6	289.9	000.0011	0140.4	025.2	28.84
139.0	000.1056	0067.0	008.6	289.6	000.0011	0139.0	025.3	28.69
140.0	000.1100	0066.7	008.6	289.2	000.0011	0137.6	025.3	28.58
141.0	000.1100	0067.0	008.7	288.9	000.0011	0136.4	025.4	28.46
142.0	000.1100	0068.4	008.8	288.5	000.0011	0135.6	025.4	28.40
143.0	000.1100	0069.2	008.8	288.2	000.0011	0137.0	025.4	28.46
144.0	000.1100	0070.6	008.9	287.8	000.0011	0138.6	025.5	28.55
145.0	000.1100	0070.2	008.9	287.5	000.0011	0139.5	025.6	28.52
146.0	000.1100	0071.7	009.0	287.1	000.0011	0141.0	025.6	28.61
147.0	000.1100	0073.7	009.1	286.7	000.0011	0143.4	025.6	28.75
148.0	000.1100	0075.3	009.2	286.3	000.0011	0145.2	025.6	28.85
149.0	000.1100	0076.7	009.3	285.9	000.0011	0146.0	025.7	28.86
150.0	000.1100	0075.2	009.2	285.8	000.0011	0146.0	025.9	28.74
151.0	000.1100	0075.7	009.2	285.5	000.0011	0146.0	025.9	28.67
152.0	000.1100	0076.2	009.2	285.2	000.0011	0146.0	026.0	28.60

Exhibit 7b

Contour Protection Studies Toward Select Allocation Concern(s)

01-10-2021 Terrain Data: NED 03 SEC FMOver Analysis

W260AS BLFT20090304ABF

W260CF.P

Channel = 260D
 Max ERP = 0.01 kW
 RCAMSL = 205 m
 N. Lat. 42 46 23.30
 W. Lng. 71 05 59.20
 Protected
 60 dBu

Channel = 260D
 Max ERP = 0.11 kW
 RCAMSL = 157.3 m
 N. Lat. 42 54 26.90
 W. Lng. 71 27 40.90
 Interfering
 40 dBu

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)	IX (km)
254.0	000.0100	0152.9	007.2	126.7	000.0704	0064.1	028.2	37.96	
255.0	000.0100	0152.5	007.2	126.5	000.0704	0063.9	028.1	37.99	
256.0	000.0100	0152.9	007.2	126.4	000.0704	0063.7	028.0	38.03	
257.0	000.0100	0155.5	007.2	126.3	000.0704	0063.6	027.9	38.09	
258.0	000.0100	0156.4	007.2	126.2	000.0704	0063.3	027.8	38.13	
259.0	000.0100	0155.5	007.2	126.0	000.0704	0063.0	027.7	38.14	
260.0	000.0100	0156.3	007.2	125.8	000.0704	0062.8	027.6	38.17	
261.0	000.0100	0156.9	007.3	125.7	000.0704	0062.5	027.5	38.20	
262.0	000.0100	0157.3	007.3	125.5	000.0704	0062.1	027.4	38.21	
263.0	000.0100	0157.4	007.3	125.3	000.0704	0061.7	027.3	38.21	
264.0	000.0100	0157.5	007.3	125.1	000.0704	0061.4	027.2	38.23	
265.0	000.0100	0159.4	007.3	125.0	000.0704	0061.3	027.1	38.29	
266.0	000.0100	0159.3	007.3	124.8	000.0704	0061.0	027.0	38.31	
267.0	000.0100	0158.3	007.3	124.5	000.0704	0060.6	027.0	38.29	
268.0	000.0100	0156.6	007.3	124.2	000.0704	0060.2	026.9	38.27	
269.0	000.0100	0156.7	007.3	124.0	000.0704	0060.1	026.9	38.30	
270.0	000.0100	0157.8	007.3	123.8	000.0704	0059.9	026.8	38.34	
271.0	000.0100	0157.1	007.3	123.6	000.0704	0059.7	026.7	38.35	
272.0	000.0100	0156.0	007.2	123.3	000.0704	0059.7	026.7	38.38	
273.0	000.0100	0152.3	007.1	123.0	000.0704	0059.3	026.7	38.32	
274.0	000.0100	0148.1	007.0	122.7	000.0704	0058.8	026.7	38.23	
275.0	000.0100	0145.1	007.0	122.4	000.0704	0057.9	026.7	38.10	
276.0	000.0100	0145.2	007.0	122.1	000.0704	0057.1	026.6	38.02	
277.0	000.0100	0145.5	007.0	121.9	000.0704	0056.2	026.6	37.92	
278.0	000.0100	0145.0	007.0	121.7	000.0704	0055.6	026.5	37.86	
279.0	000.0100	0143.3	006.9	121.4	000.0704	0055.2	026.5	37.80	
280.0	000.0100	0144.7	007.0	121.2	000.0704	0055.1	026.5	37.84	
281.0	000.0100	0145.4	007.0	120.9	000.0704	0054.8	026.4	37.83	
282.0	000.0100	0146.6	007.0	120.7	000.0704	0054.6	026.3	37.84	
283.0	000.0100	0146.5	007.0	120.4	000.0704	0054.3	026.3	37.81	
284.0	000.0100	0146.2	007.0	120.2	000.0704	0054.3	026.3	37.84	

Exhibit 7b

Contour Protection Studies Toward Select Allocation Concern(s)

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)
285.0	000.0100	0146.0	007.0	119.9	000.0707	0054.6	026.2	37.92
286.0	000.0100	0145.9	007.0	119.7	000.0716	0055.0	026.2	38.06
287.0	000.0100	0141.7	006.9	119.4	000.0727	0055.6	026.3	38.18
288.0	000.0100	0137.7	006.8	119.1	000.0737	0056.0	026.3	38.26
289.0	000.0100	0136.6	006.8	118.8	000.0747	0056.4	026.3	38.36
290.0	000.0100	0141.0	006.9	118.6	000.0755	0056.9	026.2	38.57
291.0	000.0100	0144.1	007.0	118.3	000.0764	0057.3	026.1	38.74
292.0	000.0100	0143.5	006.9	118.1	000.0774	0057.7	026.1	38.85
293.0	000.0100	0141.5	006.9	117.8	000.0784	0057.8	026.2	38.91
294.0	000.0100	0141.0	006.9	117.5	000.0794	0058.1	026.2	38.99
295.0	000.0100	0143.1	006.9	117.3	000.0803	0058.2	026.1	39.10
296.0	000.0100	0144.1	007.0	117.0	000.0813	0058.5	026.1	39.23
297.0	000.0100	0142.4	006.9	116.7	000.0823	0059.0	026.1	39.32
298.0	000.0100	0140.4	006.9	116.5	000.0833	0058.9	026.2	39.32
299.0	000.0100	0141.1	006.9	116.2	000.0843	0058.7	026.2	39.35
300.0	000.0100	0139.7	006.9	116.0	000.0853	0058.4	026.2	39.34
301.0	000.0100	0140.3	006.9	115.7	000.0864	0058.2	026.2	39.37
302.0	000.0100	0140.9	006.9	115.4	000.0874	0058.0	026.2	39.38
303.0	000.0100	0141.7	006.9	115.2	000.0884	0057.6	026.2	39.39
304.0	000.0100	0140.3	006.9	114.9	000.0894	0057.1	026.2	39.33
305.0	000.0100	0139.1	006.8	114.7	000.0904	0056.4	026.3	39.24
306.0	000.0100	0138.7	006.8	114.4	000.0914	0055.7	026.3	39.15
307.0	000.0100	0136.7	006.8	114.2	000.0923	0054.8	026.4	39.00
308.0	000.0100	0136.5	006.8	113.9	000.0933	0054.1	026.4	38.92
309.0	000.0100	0138.2	006.8	113.7	000.0944	0053.7	026.4	38.91
310.0	000.0100	0135.8	006.8	113.5	000.0953	0053.6	026.5	38.89
311.0	000.0100	0134.4	006.7	113.2	000.0962	0053.6	026.6	38.88
312.0	000.0100	0134.7	006.7	113.0	000.0972	0053.4	026.6	38.87
313.0	000.0100	0135.2	006.7	112.7	000.0983	0053.1	026.6	38.86
314.0	000.0100	0134.6	006.7	112.5	000.0992	0052.7	026.7	38.79
315.0	000.0100	0136.1	006.8	112.3	000.1003	0052.2	026.7	38.74
316.0	000.0100	0137.3	006.8	112.0	000.1014	0051.8	026.7	38.71
317.0	000.0100	0137.2	006.8	111.8	000.1024	0051.5	026.8	38.67
318.0	000.0100	0136.2	006.8	111.6	000.1033	0051.2	026.8	38.61
319.0	000.0100	0136.6	006.8	111.3	000.1042	0051.0	026.9	38.58
320.0	000.0100	0135.9	006.8	111.1	000.1051	0050.7	027.0	38.52
321.0	000.0100	0134.9	006.7	110.9	000.1060	0050.6	027.0	38.48
322.0	000.0100	0132.9	006.7	110.8	000.1067	0050.5	027.1	38.43
323.0	000.0100	0132.4	006.7	110.6	000.1075	0050.5	027.2	38.42
324.0	000.0100	0132.9	006.7	110.3	000.1085	0050.3	027.3	38.40
325.0	000.0100	0130.1	006.6	110.2	000.1090	0050.1	027.4	38.31
326.0	000.0100	0127.9	006.6	110.1	000.1096	0050.0	027.5	38.23
327.0	000.0100	0128.0	006.6	109.9	000.1100	0049.7	027.5	38.17
328.0	000.0100	0128.6	006.6	109.7	000.1100	0049.4	027.6	38.07

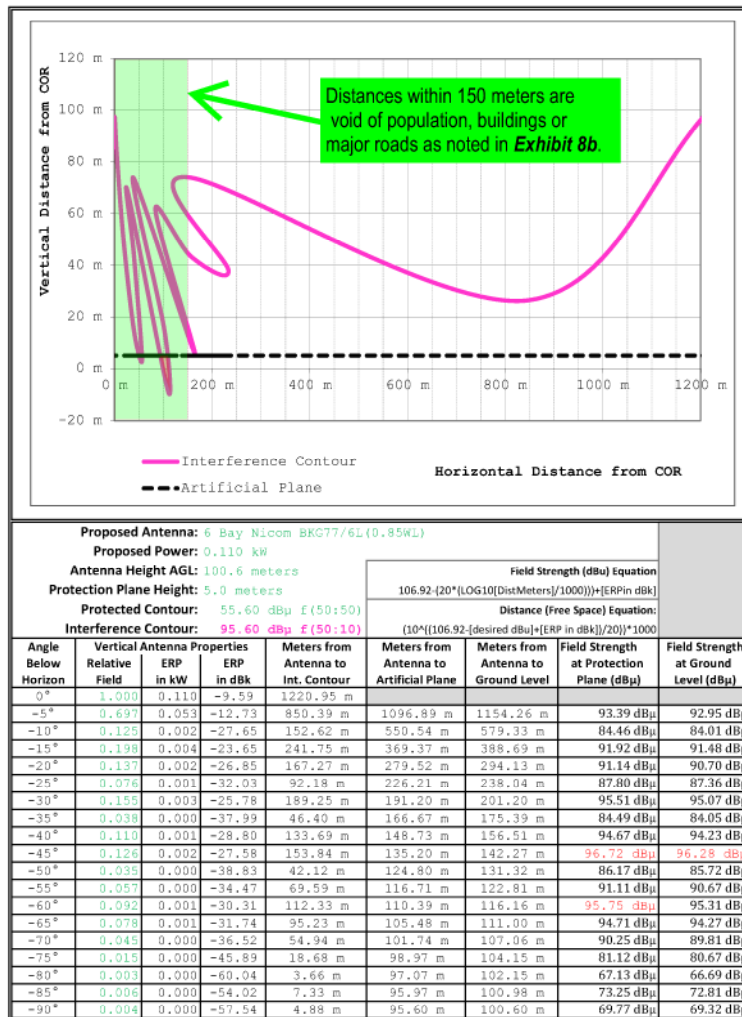
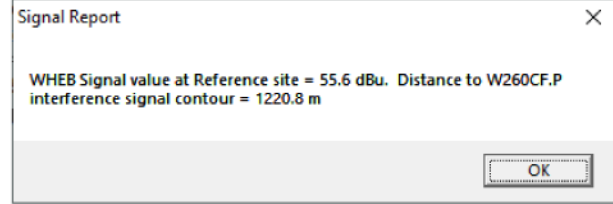
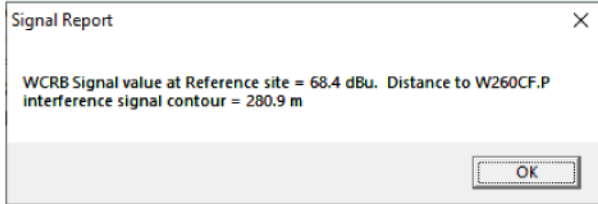
Exhibit 8a

47 C.F.R. Section 74.1204(d) Second / Third Adjacent Given Interference Waiver Request

The applicant would like to note the existence of a 47 C.F.R. Section 74.1204(d) Second/Third Adjacent Channel Given Interference Waiver Request toward WCRB(FM) - Lowell, MA (CH258B) and WHEB(FM) - Portsmouth, NH (CH262B) as included in **Exhibit(s) 8(a-b)**. In this instance, the worst case affected station's signal strength at the Translator site has been identified as the 55.6 dBμ F(50:50) service contour, associated with a Translator interference contour adjusted by +40 dBμ per 47 C.F.R. Section 74.1204(a).

Concerning distances between 150 meters of the Translator site to the extent of the interference contour, protection has been demonstrated through a downward radiation study as included in **Exhibit 8a**. Full protection will be afforded all concerns as this portion of the interference area will not reach the ground nor a five meter artificial plane representing a standard two story home when taking into account the downward radiation characteristics of the antenna as supplied by the antenna manufacturer. A copy of the antenna manufacturer's vertical radiation pattern data has been included in **Exhibit 9**.

Concerning distances within 150 meters of the Translator site, protection has been demonstrated through aerial photography of the site as included in **Exhibit 8b**. Full protection will be afforded all concerns as this portion of the interference area is void of all housing, buildings or major roads representing locations where people live, work or travel on a regular basis. The applicant would like to note the existence of several dedicated transmitter buildings within this affected radius, however, buildings of this nature have been routinely exempt as a matter of FCC Policy (see similar grant under BPFT-20160129ALR).



The National Map Advanced Viewer

The applicant would like to note the existence of a 47 C.F.R. Section 74.1204(d) Second/Third Adjacent Channel Given Interference Waiver Request toward WCRB(FM) - Lowell, MA (CH258B) and WHEB(FM) - Portsmouth, NH (CH262B) as included in **Exhibit(s) 8(a-b)**. In this instance, the worst case affected station's signal strength at the Translator site has been identified as the 55.6 dBμ F(50:50) service contour, associated with a Translator interference contour adjusted by +40 dBμ per 47 C.F.R. Section 74.1204(a).

Concerning distances between 150 meters of the Translator site to the extent of the interference contour, protection has been demonstrated through a downward radiation study as included in **Exhibit 8a**. Full protection will be afforded all concerns as this portion of the interference area will not reach the ground nor a five meter artificial plane representing a standard two story home when taking into account the downward radiation characteristics of the antenna as supplied by the antenna manufacturer. A copy of the antenna manufacturer's vertical radiation pattern data has been included in **Exhibit 9**.

Concerning distances within 150 meters of the Translator site, protection has been demonstrated through aerial photography of the site as included in **Exhibit 8b**. Full protection will be afforded all concerns as this portion of the interference area is void of all housing, buildings or major roads representing locations where people live, work or travel on a regular basis. The applicant would like to note the existence of several dedicated transmitter buildings within this affected radius, however, buildings of this nature have been routinely exempt as a matter of FCC Policy (see similar grant under BPFT-20160129ALR).

Site Coordinates

(NGS NADCON)

Latitude

Longitude

NAD 27 datum: ---

NAD 83 datum: 42 54 26.90000

71 27 40.90000

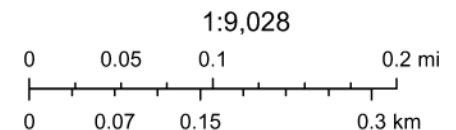
150 meter arc

Dedicated transmitter buildings. Structures of this nature have been exempt as a matter of FCC Policy (see similar grant under BPFT-20160129ALR)

Exhibit 8b
***§74.1204(d) 2nd/3rd Adjacent Channel
Given Interference Waiver Request***

1/10/2021, 9:05:34 AM

Asher Broadcast Consulting LLC
justinasher@consultant.com
1 (202) 875-2986



USGS The National Map: Orthoimagery. Data refreshed October, 2020.

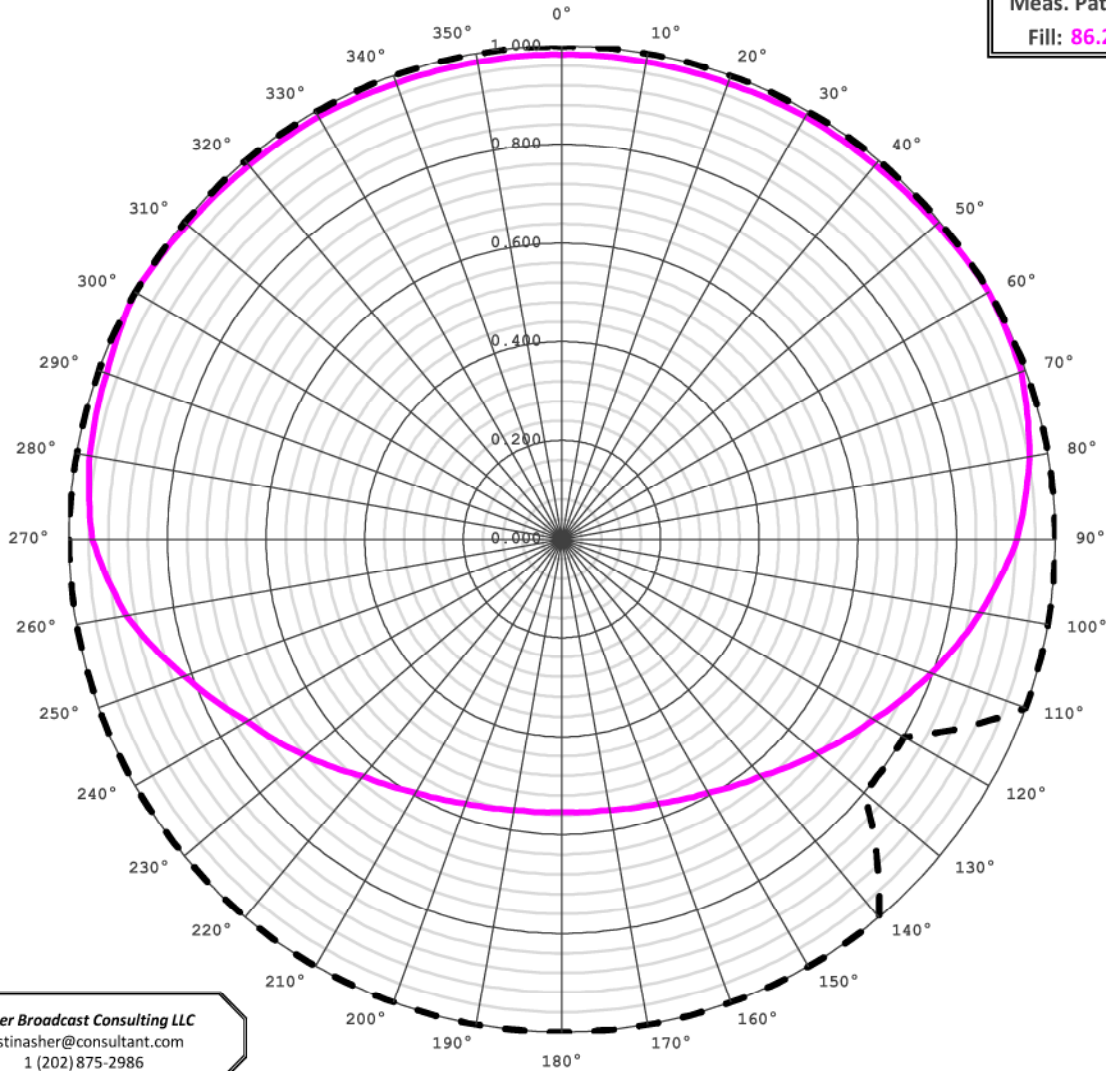
USGS

Manufacturer's	Make/Model	Orientation	Power
Element 1:	BKG77	000° True	100.0%
Element 2:			
Element 3:			
Element 4:			

Composite Power: 100%

Exhibit 9 - Copy of Manufacturer's Directional Antenna Pattern Data

Meas. Pattern
Fill: 86.2%



Azimuth ° True	FCC Pattern	Manufacturer's Pattern
0°	1.000	0.983
10°	1.000	0.983
20°	1.000	0.983
30°	1.000	0.988
40°	1.000	0.988
50°	1.000	0.992
60°	1.000	1.000
70°	1.000	0.991
80°	1.000	0.963
90°	1.000	0.923
100°	1.000	0.862
110°	1.000	0.797
120°	0.800	0.731
130°	0.800	0.676
140°	1.000	0.628
150°	1.000	0.594
160°	1.000	0.571
170°	1.000	0.558
180°	1.000	0.553
190°	1.000	0.558
200°	1.000	0.571
210°	1.000	0.594
220°	1.000	0.628
230°	1.000	0.682
240°	1.000	0.738
250°	1.000	0.815
260°	1.000	0.897
270°	1.000	0.953
280°	1.000	0.973
290°	1.000	0.983
300°	1.000	1.000
310°	1.000	0.992
320°	1.000	0.988
330°	1.000	0.988
340°	1.000	0.983
350°	1.000	0.983

Asher Broadcast Consulting LLC
justinasher@consultant.com
1 (202) 875-2986

Allocation (FCC) Pattern: ---
Manufacturer's Pattern: ———

Exhibit 9
Copy of Manufacturer's Directional Antenna Documentation
(Actual Antenna Pattern rotated to 000.0°T) (public record copy)



Your Number 1 Source For Radio And Digital TV Gear

BKG 77

Medium Power Broadband FM Circular Polarization Antenna

TECHNICAL SPECIFICATIONS

Antenna type: circular
polarization: dipole
Front-to-back ratio: 3 dB
Frequency range: 87.5 - 108 MHz
Lightening protection: all parts grounded
Bandwidth: 20 MHz
Max wind velocity: 120 mph (190 km/h)
Impedance: 50 ohms
Wind load: 53 Lbs (24 kg)
Connectors: N type (1 kw) -7/8 type / 7/16DIN(2 kw)
Wind surface: 1.1 ft² (0.10 m²)
Power rating: 2000 Watts max
Materials (external): stainless steel
VSWR: < 1.3
Mounting: from 2" to 4"
Polarization: vertical and horizontal
Weight: 25 Lbs (11.3 kg)
Gain: - 3 dBd (referred to half-wave dipole)
Dimensions: 58"x32"x32" (1450×800×800mm)
H plane: omnidirectional ±1.5 dB (with a 4" mast)
V plane: omnidirectional ±3 dB (with a 4" mast)
Packing: 68"×10"×10"



Optional Mini-Radome

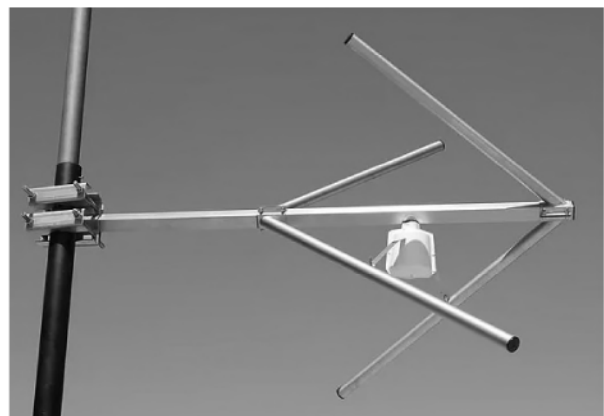


Exhibit 9

Copy of Manufacturer's Directional Antenna Documentation (Actual Antenna Pattern rotated to 000.0°T) (public record copy)

Date: 29/04/2013

TX station: BKG77-6(0.85wl)

Site name:

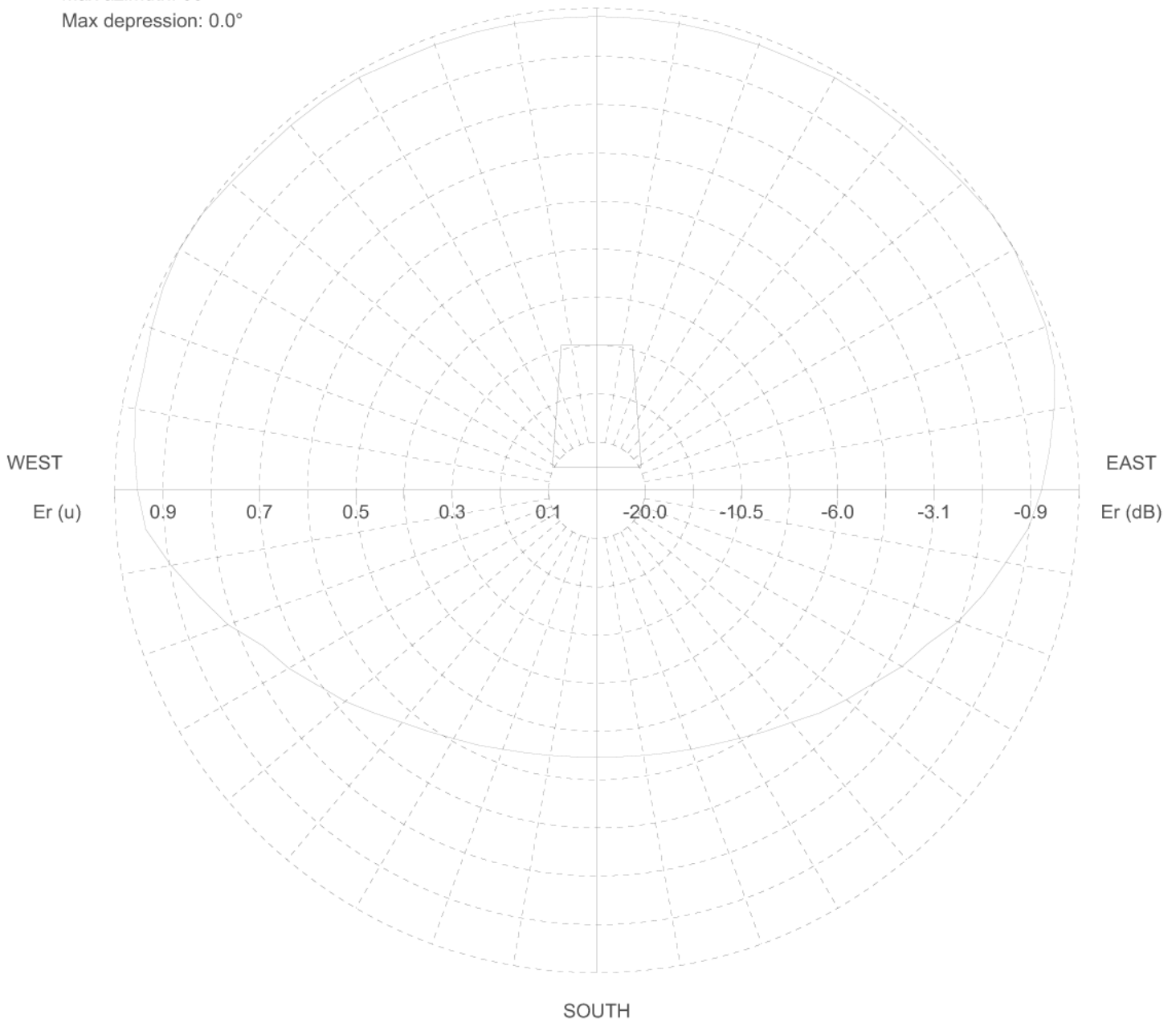
Frequency: 100.00 MHz

Horizontal diagram of Maxima

NORTH

Max azimuth: 60°

Max depression: 0.0°



0.0° depres. (Total antenna), Gain (dBd): -3.03 ERP T.max (KW): 0.498

ERP E.max (KW): 0.387

NicomUsa, Inc

Exhibit 9

Copy of Manufacturer's Directional Antenna Documentation (Actual Antenna Pattern rotated to 000.0°T) (public record copy)

Date: 29/04/2013

TX station: BKG77-6(0.85wl)

Site name:

Frequency: 100.00 MHz

Horizontal diagram of Maxima

Az (°)	Dep (°)	Er (%)	ERP (W)	Az (°)	Dep (°)	Er (%)	ERP (W)	Az (°)	Dep (°)	Er (%)	ERP (W)
0.0	0.0	98.3	373.6	120.0	0.0	73.1	206.6	240.0	0.0	73.8	210.7
5.0	0.0	98.3	373.6	125.0	0.0	69.9	189.2	245.0	0.0	76.4	225.7
10.0	0.0	98.3	373.6	130.0	0.0	67.6	176.7	250.0	0.0	81.5	256.6
15.0	0.0	98.3	373.6	135.0	0.0	65.3	165.1	255.0	0.0	85.3	281.6
20.0	0.0	98.3	373.6	140.0	0.0	62.8	152.7	260.0	0.0	89.7	311.1
25.0	0.0	98.3	373.6	145.0	0.0	61.0	144.0	265.0	0.0	93.9	341.1
30.0	0.0	98.8	377.5	150.0	0.0	59.4	136.3	270.0	0.0	95.3	351.1
35.0	0.0	98.8	377.5	155.0	0.0	58.0	130.3	275.0	0.0	96.3	358.5
40.0	0.0	98.8	377.5	160.0	0.0	57.1	126.1	280.0	0.0	97.3	366.1
45.0	0.0	98.8	377.5	165.0	0.0	56.3	122.8	285.0	0.0	97.3	366.1
50.0	0.0	99.2	380.8	170.0	0.0	55.8	120.3	290.0	0.0	98.3	373.6
55.0	0.0	100.0	386.5	175.0	0.0	55.4	118.7	295.0	0.0	99.3	381.4
60.0	0.0	100.0	386.7	180.0	0.0	55.3	118.2	300.0	0.0	100.0	386.7
65.0	0.0	99.3	381.4	185.0	0.0	55.4	118.7	305.0	0.0	100.0	386.5
70.0	0.0	99.1	380.0	190.0	0.0	55.8	120.3	310.0	0.0	99.2	380.8
75.0	0.0	98.3	373.6	195.0	0.0	56.3	122.8	315.0	0.0	98.8	377.5
80.0	0.0	96.3	358.5	200.0	0.0	57.1	126.1	320.0	0.0	98.8	377.5
85.0	0.0	94.3	343.8	205.0	0.0	58.3	131.4	325.0	0.0	98.8	377.5
90.0	0.0	92.3	329.3	210.0	0.0	59.4	136.5	330.0	0.0	98.8	377.5
95.0	0.0	90.0	312.9	215.0	0.0	61.0	144.0	335.0	0.0	98.3	373.6
100.0	0.0	86.2	287.1	220.0	0.0	62.8	152.7	340.0	0.0	98.3	373.6
105.0	0.0	83.0	266.7	225.0	0.0	65.3	165.1	345.0	0.0	98.3	373.6
110.0	0.0	79.7	245.9	230.0	0.0	68.2	179.6	350.0	0.0	98.3	373.6
115.0	0.0	75.6	221.0	235.0	0.0	70.6	192.7	355.0	0.0	98.3	373.6

Exhibit 9

Copy of Manufacturer's Directional Antenna Documentation

(Actual Antenna Pattern rotated to 000.0°T)

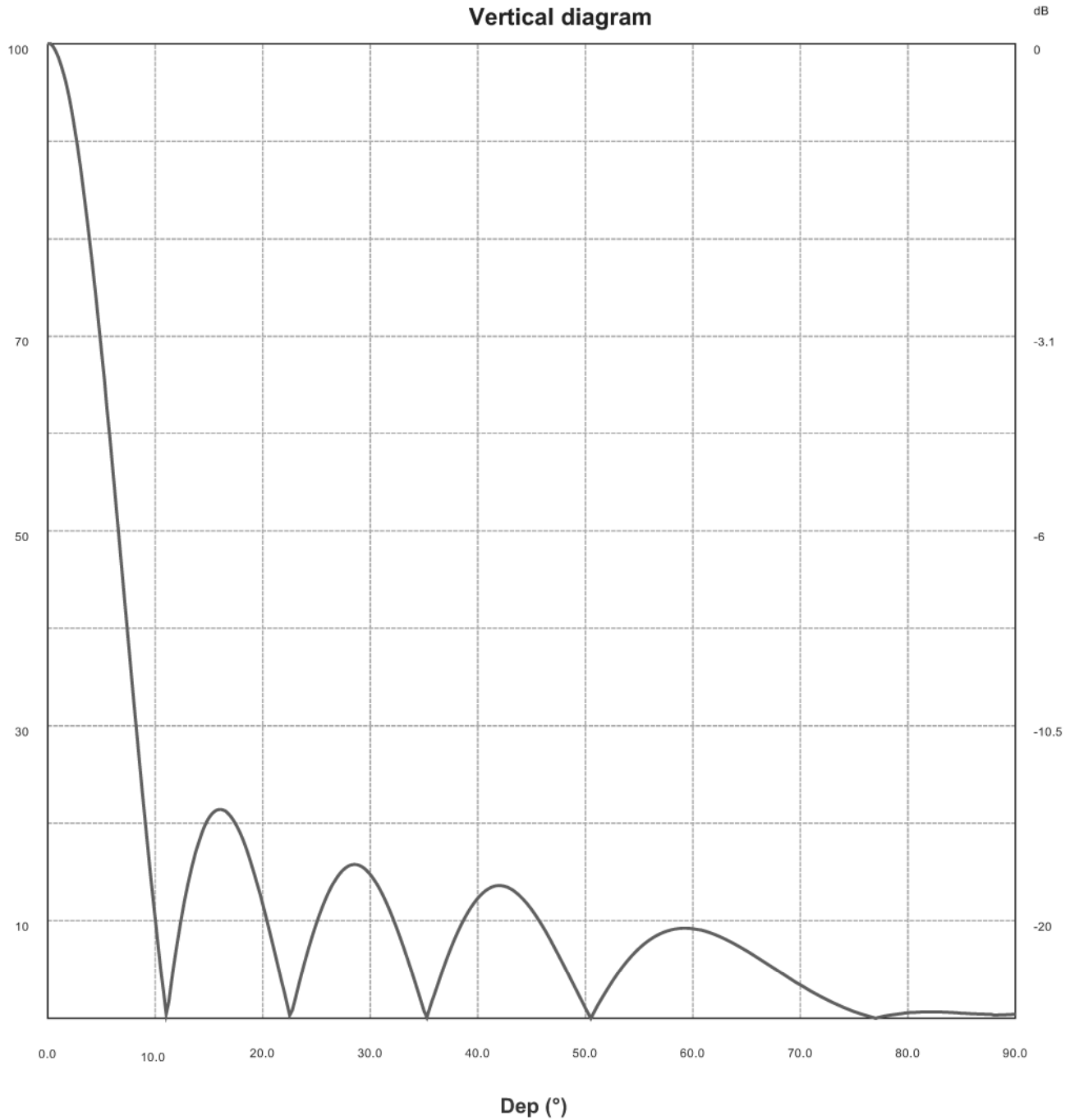
(public record copy)

TX station: BKG77-6(0.85wl)

Site name:

Frequency: 100.00 MHz

Vertical diagram



— 0.0° Az. (Total Antenna)

Exhibit 9

Copy of Manufacturer's Directional Antenna Documentation

(Actual Antenna Pattern rotated to 000.0°T) (public record copy)

TX station: BKG77-6(0.85wl)

Site name:

Frequency: 100.00 MHz

Vertical diagram at an azimuth of 0.0°

Dep (°)	Er (%)	ERP (W)	Dep (°)	Er (%)	ERP (W)	Dep (°)	Er (%)	ERP (W)
0.0	100.1	2.7	15.4	20.5	0.1	30.7	14.8	0.1
0.3	100.0	2.7	15.6	20.9	0.1	31.0	14.4	0.1
0.5	99.7	2.7	15.9	21.2	0.1	31.2	14.0	0.1
0.8	99.2	2.7	16.1	21.3	0.1	31.5	13.5	0.0
1.0	98.6	2.7	16.4	21.4	0.1	31.7	13.0	0.0
1.3	97.8	2.6	16.6	21.4	0.1	32.0	12.4	0.0
1.5	96.8	2.6	16.9	21.2	0.1	32.3	11.8	0.0
1.8	95.6	2.5	17.2	21.0	0.1	32.5	11.2	0.0
2.0	94.3	2.4	17.4	20.7	0.1	32.8	10.5	0.0
2.3	92.9	2.4	17.7	20.3	0.1	33.0	9.8	0.0
2.6	91.3	2.3	17.9	19.8	0.1	33.3	9.1	0.0
2.8	89.5	2.2	18.2	19.3	0.1	33.5	8.3	0.0
3.1	87.6	2.1	18.4	18.7	0.1	33.8	7.5	0.0
3.3	85.6	2.0	18.7	18.0	0.1	34.0	6.7	0.0
3.6	83.4	1.9	18.9	17.2	0.1	34.3	5.9	0.0
3.8	81.1	1.8	19.2	16.4	0.1	34.6	5.1	0.0
4.1	78.8	1.7	19.5	15.6	0.1	34.8	4.2	0.0
4.4	76.3	1.6	19.7	14.6	0.1	35.1	3.4	0.0
4.6	73.7	1.5	20.0	13.7	0.1	35.3	2.5	0.0
4.9	71.0	1.4	20.2	12.7	0.0	35.6	1.6	0.0
5.1	68.3	1.3	20.5	11.6	0.0	35.8	0.8	0.0
5.4	65.5	1.2	20.7	10.6	0.0	36.1	0.1	0.0
5.6	62.6	1.1	21.0	9.5	0.0	36.4	1.0	0.0
5.9	59.7	1.0	21.2	8.4	0.0	36.6	1.8	0.0
6.1	56.7	0.9	21.5	7.2	0.0	36.9	2.6	0.0
6.4	53.7	0.8	21.8	6.1	0.0	37.1	3.4	0.0
6.7	50.7	0.7	22.0	4.9	0.0	37.4	4.2	0.0
6.9	47.6	0.6	22.3	3.8	0.0	37.6	5.0	0.0
7.2	44.5	0.5	22.5	2.6	0.0	37.9	5.8	0.0
7.4	41.5	0.5	22.8	1.4	0.0	38.1	6.5	0.0
7.7	38.4	0.4	23.0	0.3	0.0	38.4	7.2	0.0
7.9	35.4	0.3	23.3	0.8	0.0	38.7	7.9	0.0
8.2	32.4	0.3	23.6	1.9	0.0	38.9	8.5	0.0
8.4	29.4	0.2	23.8	3.0	0.0	39.2	9.1	0.0
8.7	26.4	0.2	24.1	4.1	0.0	39.4	9.7	0.0
9.0	23.5	0.2	24.3	5.1	0.0	39.7	10.2	0.0
9.2	20.7	0.1	24.6	6.1	0.0	39.9	10.7	0.0
9.5	17.9	0.1	24.8	7.1	0.0	40.2	11.2	0.0
9.7	15.1	0.1	25.1	8.0	0.0	40.4	11.6	0.0
10.0	12.5	0.0	25.3	8.9	0.0	40.7	12.0	0.0
10.2	9.9	0.0	25.6	9.8	0.0	41.0	12.3	0.0
10.5	7.4	0.0	25.9	10.6	0.0	41.2	12.6	0.0
10.8	5.0	0.0	26.1	11.3	0.0	41.5	12.9	0.0
11.0	2.7	0.0	26.4	12.0	0.0	41.7	13.1	0.0
11.3	0.4	0.0	26.6	12.6	0.0	42.0	13.3	0.0
11.5	1.7	0.0	26.9	13.2	0.0	42.2	13.4	0.0
11.8	3.7	0.0	27.1	13.8	0.1	42.5	13.5	0.0
12.0	5.6	0.0	27.4	14.2	0.1	42.8	13.6	0.1
12.3	7.5	0.0	27.6	14.6	0.1	43.0	13.6	0.1
12.5	9.2	0.0	27.9	15.0	0.1	43.3	13.6	0.1
12.8	10.8	0.0	28.2	15.3	0.1	43.5	13.5	0.0
13.1	12.2	0.0	28.4	15.5	0.1	43.8	13.4	0.0
13.3	13.6	0.1	28.7	15.6	0.1	44.0	13.3	0.0
13.6	14.9	0.1	28.9	15.7	0.1	44.3	13.1	0.0
13.8	16.0	0.1	29.2	15.8	0.1	44.5	12.9	0.0
14.1	17.1	0.1	29.4	15.8	0.1	44.8	12.7	0.0
14.3	18.0	0.1	29.7	15.7	0.1	45.1	12.5	0.0
14.6	18.8	0.1	30.0	15.5	0.1	45.3	12.2	0.0
14.8	19.5	0.1	30.2	15.3	0.1	45.6	11.9	0.0
15.1	20.1	0.1	30.5	15.1	0.1	45.8	11.5	0.0

Exhibit 9

Copy of Manufacturer's Directional Antenna Documentation (Actual Antenna Pattern rotated to 000.0°T) (public record copy)

TX station: BKG77-6(0.85w)

Site name:

Frequency: 100.00 MHz

Vertical diagram at an azimuth of 0°

Dep (°)	Er (%)	ERP (W)	Dep (°)	Er (%)	ERP (W)	Dep (°)	Er (%)	ERP (W)
46.1	11.1	0.0	61.4	9.2	0.0	76.8	0.7	0.0
46.3	10.8	0.0	61.7	9.1	0.0	77.1	0.6	0.0
46.6	10.3	0.0	62.0	9.1	0.0	77.3	0.5	0.0
46.8	9.9	0.0	62.2	9.0	0.0	77.6	0.4	0.0
47.1	9.5	0.0	62.5	9.0	0.0	77.8	0.3	0.0
47.4	9.0	0.0	62.7	8.9	0.0	78.1	0.2	0.0
47.6	8.5	0.0	63.0	8.8	0.0	78.3	0.1	0.0
47.9	8.0	0.0	63.2	8.7	0.0	78.6	0.1	0.0
48.1	7.5	0.0	63.5	8.6	0.0	78.8	0.0	0.0
48.4	7.0	0.0	63.7	8.5	0.0	79.1	0.1	0.0
48.6	6.5	0.0	64.0	8.4	0.0	79.4	0.1	0.0
48.9	5.9	0.0	64.3	8.2	0.0	79.6	0.2	0.0
49.2	5.4	0.0	64.5	8.1	0.0	79.9	0.2	0.0
49.4	4.8	0.0	64.8	8.0	0.0	80.1	0.3	0.0
49.7	4.3	0.0	65.0	7.8	0.0	80.4	0.3	0.0
49.9	3.7	0.0	65.3	7.7	0.0	80.6	0.4	0.0
50.2	3.2	0.0	65.5	7.5	0.0	80.9	0.4	0.0
50.4	2.7	0.0	65.8	7.4	0.0	81.2	0.5	0.0
50.7	2.1	0.0	66.0	7.2	0.0	81.4	0.5	0.0
50.9	1.6	0.0	66.3	7.0	0.0	81.7	0.5	0.0
51.2	1.0	0.0	66.6	6.9	0.0	81.9	0.5	0.0
51.5	0.5	0.0	66.8	6.7	0.0	82.2	0.6	0.0
51.7	0.0	0.0	67.1	6.5	0.0	82.4	0.6	0.0
52.0	0.5	0.0	67.3	6.4	0.0	82.7	0.6	0.0
52.2	1.0	0.0	67.6	6.2	0.0	82.9	0.6	0.0
52.5	1.5	0.0	67.8	6.0	0.0	83.2	0.6	0.0
52.7	2.0	0.0	68.1	5.8	0.0	83.5	0.6	0.0
53.0	2.4	0.0	68.4	5.7	0.0	83.7	0.6	0.0
53.2	2.9	0.0	68.6	5.5	0.0	84.0	0.6	0.0
53.5	3.3	0.0	68.9	5.3	0.0	84.2	0.6	0.0
53.8	3.8	0.0	69.1	5.1	0.0	84.5	0.6	0.0
54.0	4.2	0.0	69.4	4.9	0.0	84.7	0.6	0.0
54.3	4.6	0.0	69.6	4.8	0.0	85.0	0.6	0.0
54.5	4.9	0.0	69.9	4.6	0.0	85.2	0.6	0.0
54.8	5.3	0.0	70.1	4.4	0.0	85.5	0.6	0.0
55.0	5.7	0.0	70.4	4.2	0.0	85.8	0.6	0.0
55.3	6.0	0.0	70.7	4.1	0.0	86.0	0.6	0.0
55.6	6.3	0.0	70.9	3.9	0.0	86.3	0.6	0.0
55.8	6.6	0.0	71.2	3.7	0.0	86.5	0.5	0.0
56.1	6.9	0.0	71.4	3.6	0.0	86.8	0.5	0.0
56.3	7.1	0.0	71.7	3.4	0.0	87.0	0.5	0.0
56.6	7.4	0.0	71.9	3.2	0.0	87.3	0.5	0.0
56.8	7.6	0.0	72.2	3.1	0.0	87.6	0.5	0.0
57.1	7.8	0.0	72.4	2.9	0.0	87.8	0.5	0.0
57.3	8.0	0.0	72.7	2.7	0.0	88.1	0.4	0.0
57.6	8.2	0.0	73.0	2.6	0.0	88.3	0.4	0.0
57.9	8.4	0.0	73.2	2.4	0.0	88.6	0.4	0.0
58.1	8.5	0.0	73.5	2.3	0.0	88.8	0.4	0.0
58.4	8.7	0.0	73.7	2.1	0.0	89.1	0.4	0.0
58.6	8.8	0.0	74.0	2.0	0.0	89.3	0.4	0.0
58.9	8.9	0.0	74.2	1.9	0.0	89.6	0.4	0.0
59.1	9.0	0.0	74.5	1.7	0.0	89.9	0.4	0.0
59.4	9.1	0.0	74.8	1.6	0.0	90.1	0.3	0.0
59.6	9.1	0.0	75.0	1.5	0.0	90.4	0.3	0.0
59.9	9.2	0.0	75.3	1.3	0.0	90.6	0.3	0.0
60.2	9.2	0.0	75.5	1.2	0.0	90.9	0.3	0.0
60.4	9.2	0.0	75.8	1.1	0.0	91.1	0.3	0.0
60.7	9.2	0.0	76.0	1.0	0.0	91.4	0.4	0.0
60.9	9.2	0.0	76.3	0.9	0.0	91.6	0.4	0.0
61.2	9.2	0.0	76.5	0.8	0.0	91.9	0.4	0.0