Technical Report Supporting a Form 349 Minor Construction Permit Application

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

for

W262CL.L - Brattleboro, VT
BMLFT-20140422AAQ
(Facility ID: 140890)

"New Directional Antenna Pattern,
Increase in Power and
Correction of Coordinates"

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as a

Commercial, Fill-In
FM Translator for
WKVT-FM - Brattleboro, VT

March, 2017

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Table of Contents

Supplemental Appendix(s):

Explanation of Technical Report 1

EXPLANATION OF PROPOSAL: This Form 349 Filing and accompanying technical report supports a Minor Construction Permit Application for FM Translator W262CL.L - Brattleboro, VT (Facility ID: 140890), License File Number BMLFT-20140422AAQ. This FCC Form 349 Filing requests an increase in power and new directional antenna pattern. Continued operation on CH262D (100.3 MHz) with a new power of 0.250 kW ERP (circular polarization) at a COR of 483 meters AMSL is requested. A correction of coordinates of one second latitude and one second longitude is also requested herein. This Form 349 Filing will specify rebroadcast of new Class A, FM Primary Station WKVT-FM - Brattleboro, VT (CH224A); Facility ID No. 57780. The Translator will remain licensed to the community of Brattleboro, VT.

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 FM primary daytime 60 dBµ contour. The primary station service contour relationship has been plotted in ***Exhibit 2***.

The proposed facility will be located on an existing 45.7 meter tower which does not require Antenna Structure Registration. In support of this filing, a copy of USGS Topographic Aerial Photomapping of the existing tower site 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 FCC's own Globe 1 km terrain database for the HAAT calculation 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 C.F.R. Section 74.1204 toward all allocation protection concerns with the exception of WTHK(FM) - Wilmington, VT (CH264A). A general allocation study for this proposal is found in ***Exhibit 6***.

The applicant would like to note the existence of a C.F.R. Section 74.1204(d) Second/Third Adjacent Channel Given Interference Waiver Request toward WTHK(FM) - Wilmington, VT (CH264A). The Interference Contour at the proposed Translator site has been calculated to be no less than the 103.04 dBµ F(50:10) interference contour corresponding to the worst case protected contour at the Translator site. This represents the proposed interference contour which falls wholly within the 40:1 dB ratio. As seen in the ***Exhibit 8*** Aerial Photograph, there is a lack of population, housing, buildings or major roads within this interference contour. The applicant would like to note the existence of the dedicated transmitter building located at the base of the tower. However, structures of this nature have been exempt as a matter of FCC Policy. A copy of the manufacturer's directional antenna pattern data has been included in ***Exhibit 9***.

There are two additional 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.

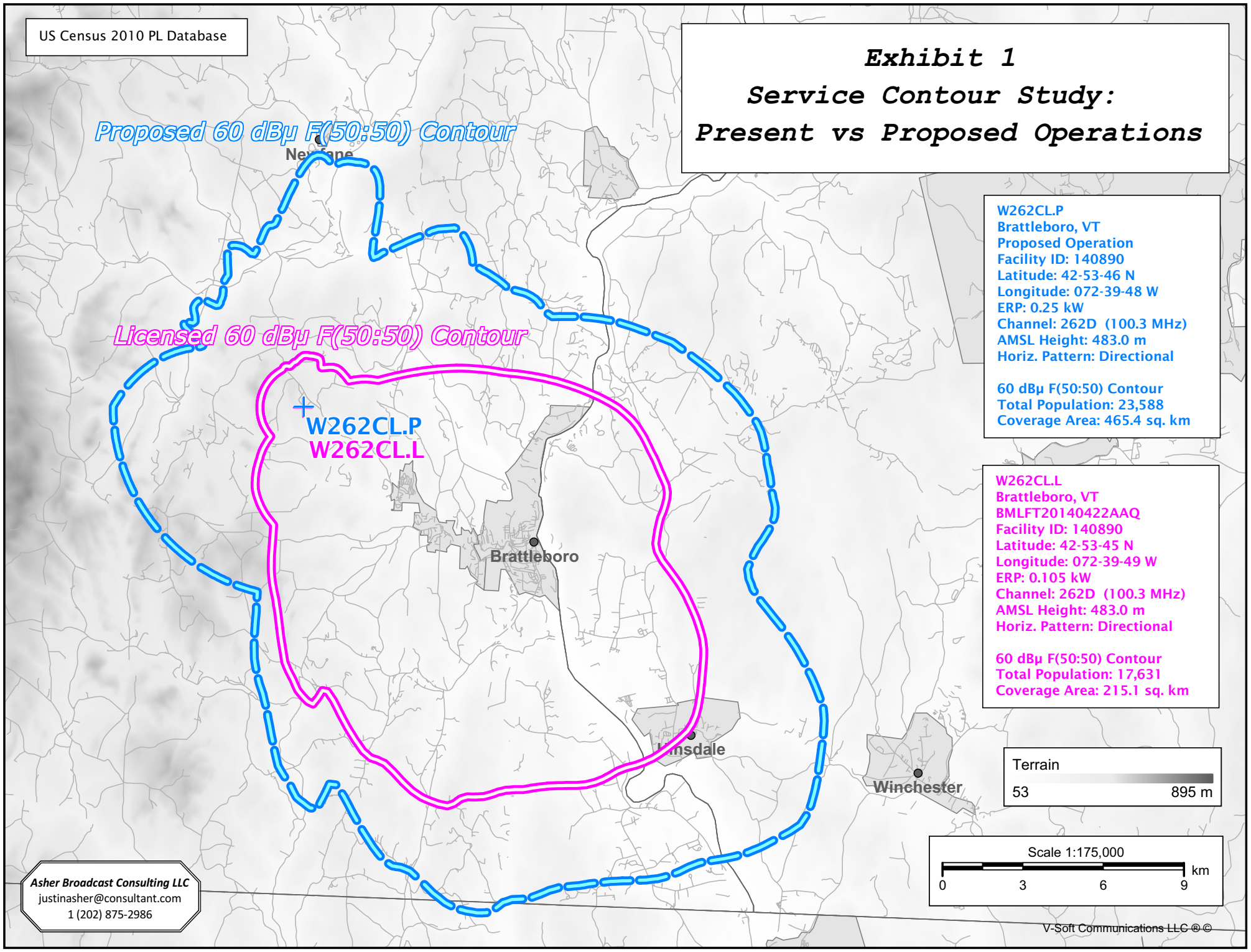
Regarding protection of international concerns, the facility is and will remain within 320 km from the common border between the United States and Canada. However full protection will be afforded all Canadian concerns as noted in ***Exhibit 6***.

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 with 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 existing antenna and feed-line are being reused on 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 seventeen 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
March 21, 2017


US Census 2010 PL Database
Exhibit 1
Service Contour Study:
Present vs Proposed Operations
Proposed 60 dBμ F(50:50) Contour
Licensed 60 dBμ F(50:50) Contour
W262CL.P
W262CL.L
Brattleboro
Winchester
W262CL.P
Brattleboro, VT
Proposed Operation
Facility ID: 140890
Latitude: 42-53-46 N
Longitude: 072-39-48 W
ERP: 0.25 kW
Channel: 262D (100.3 MHz)
AMSL Height: 483.0 m
Horiz. Pattern: Directional
60 dBμ F(50:50) Contour
Total Population: 23,588
Coverage Area: 465.4 sq. km
W262CL.L
Brattleboro, VT
BMLFT20140422AAQ
Facility ID: 140890
Latitude: 42-53-45 N
Longitude: 072-39-49 W
ERP: 0.105 kW
Channel: 262D (100.3 MHz)
AMSL Height: 483.0 m
Horiz. Pattern: Directional
60 dBμ F(50:50) Contour
Total Population: 17,631
Coverage Area: 215.1 sq. km
Terrain
53
895 m
Scale 1:175,000
0
3
6
9
km
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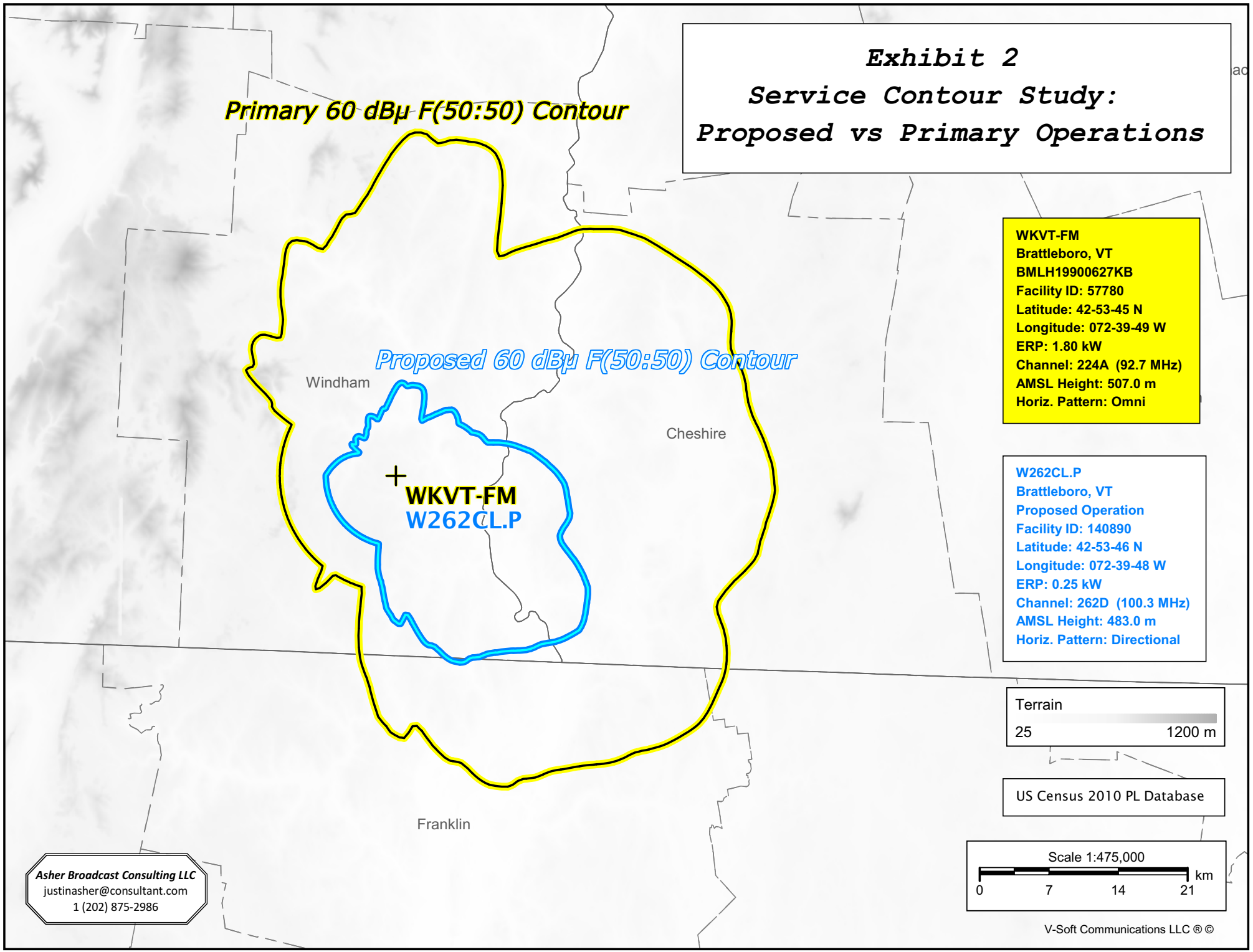
Exhibit 2
Service Contour Study:
Proposed vs Primary Operations
Primary 60 dBμ F(50:50) Contour
Proposed 60 dBμ F(50:50) Contour
Windham
Cheshire
Franklin
WKVT-FM
W262CL.P
WKVT-FM
Brattleboro, VT
BMLH19900627KB
Facility ID: 57780
Latitude: 42-53-45 N
Longitude: 072-39-49 W
ERP: 1.80 kW
Channel: 224A (92.7 MHz)
AMSL Height: 507.0 m
Horiz. Pattern: Omni
W262CL.P
Brattleboro, VT
Proposed Operation
Facility ID: 140890
Latitude: 42-53-46 N
Longitude: 072-39-48 W
ERP: 0.25 kW
Channel: 262D (100.3 MHz)
AMSL Height: 483.0 m
Horiz. Pattern: Directional
Terrain
25
1200 m
US Census 2010 PL Database
Scale 1:475,000
0
7
14
21
km
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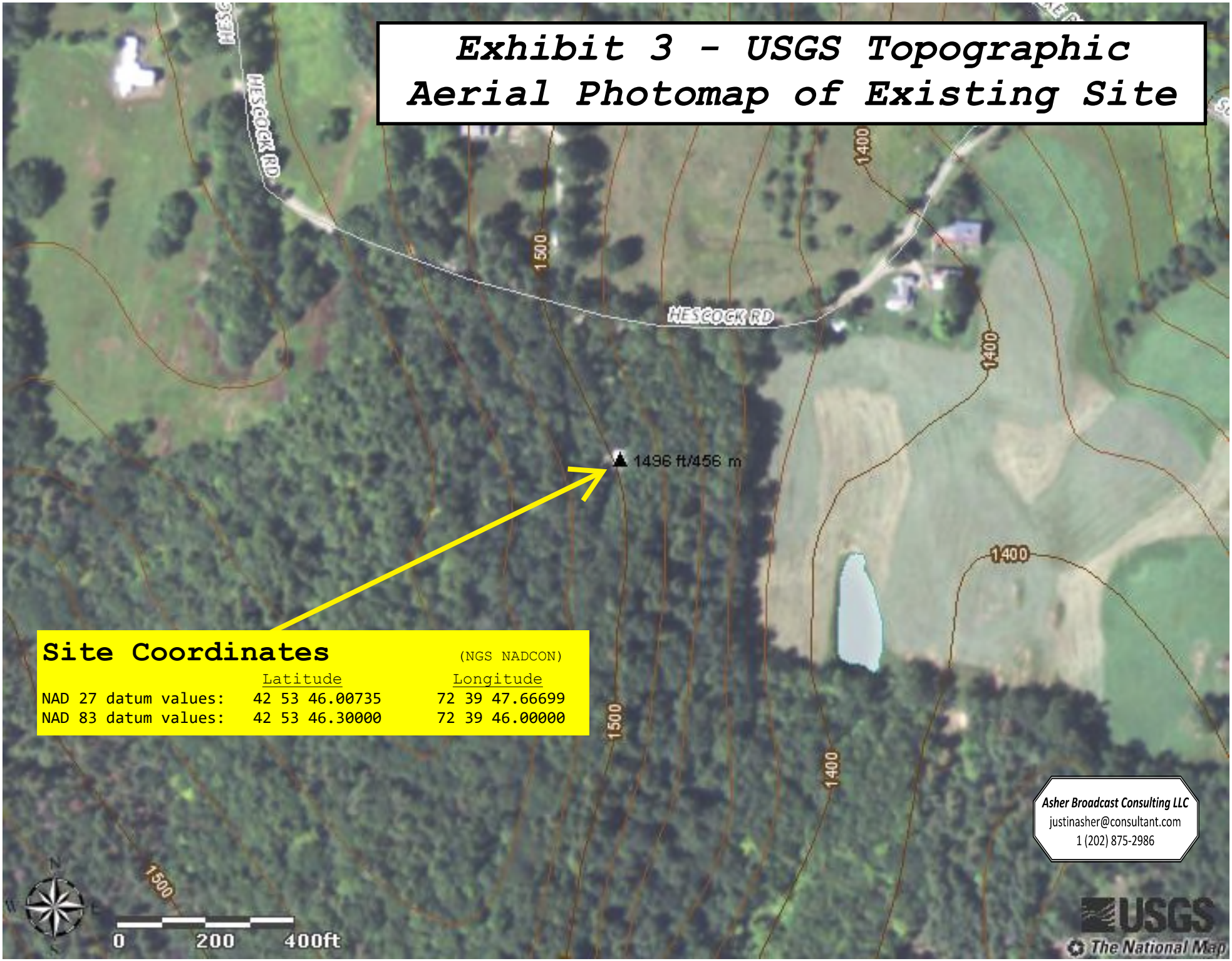
Exhibit 3 - USGS Topographic
Aerial Photomap of Existing Site
HESCOCK RD
HESCOCK RD
1500
1400
1400
1400
1500
1400
1496 ft/456 m
Site Coordinates
(NGS NADCON)
Latitude
Longitude
NAD 27 datum values: 42 53 46.00735 72 39 47.66699
NAD 83 datum values: 42 53 46.30000 72 39 46.00000
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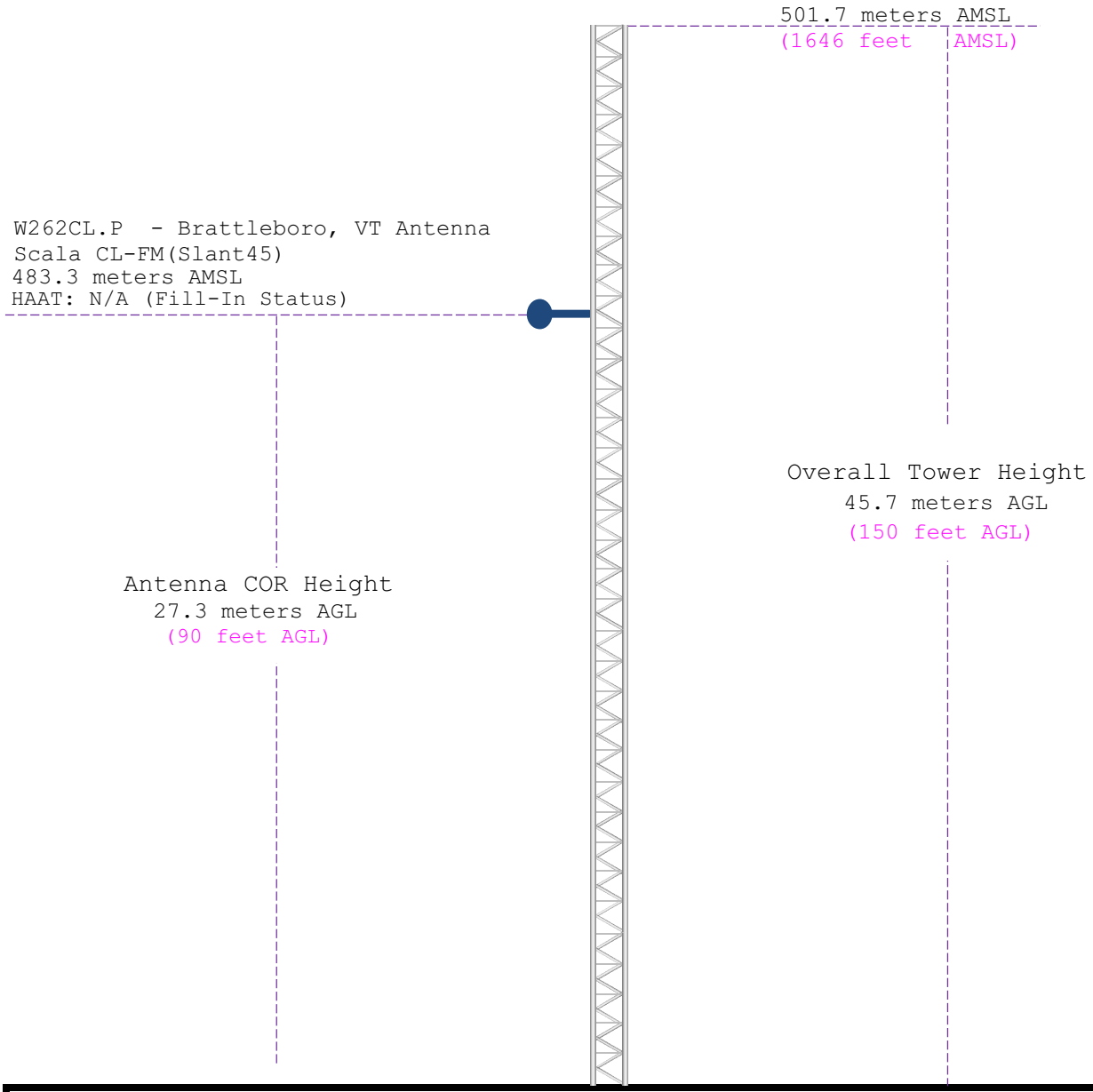
1500
0
200
400ft
USGS
The National Map

Exhibit 4
Vertical Plan of Antenna System



Ground Elevation: 456.0 meters AMSL (1496 feet AMSL)			
Address: 0.4 km southwest of the intersection of Sunset Lake Road and Hescock Road			
City: Brattleboro		**Latitude (D M S)**	**Longitude (D M S)**
County: Windham	NAD 27 datum values:	42 53 46.00735	72 39 47.66699
State: Vermont	NAD 83 datum values:	42 53 46.30000	72 39 46.00000
Antenna Structure Registration Not Required	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 (1927): (from fcc.gov)

Antenna Height Above Average Terrain Calculations -- Results

Input Data

Latitude **42° 53' 46"** North
Longitude **72° 39' 48"** West (NAD 27)
These coordinates convert to NAD 83 coordinates of
42° 53' 46.29", North, 72° 39' 46.33" West (NAD 83).
Height of antenna radiation center above mean sea level: **483** meters AMSL
Number of Evenly Spaced Radials = **12** 0° is referenced to True North

Results

Calculated HAAT = **135 meters**

Antenna Height Above Average Terrain calculated
using 1 km GLOBE terrain data

Individual "Radial HAAT" Values, in meters

0°	210.2 m	30°	121.0 m
60°	298.3 m	90°	304.1 m
120°	297.5 m	150°	235.8 m
180°	127.7 m	210°	12.7 m
240°	-57.7 m	270°	-9.0 m
300°	2.5 m	330°	71.1 m

NAD 1983 to NAD 1927 Conversion:

	Latitude	Longitude
NAD 27 datum values:	42 53 46.00735	72 39 47.66699
NAD 83 datum values:	42 53 46.30000	72 39 46.00000

Various Coordinate Conversion Calculations (NAD 1983):

Position Type	Lat Lon
Degrees Lat Long	42.8961944°, -072.6627778°
Degrees Minutes	42°53.77167', -072°39.76667'
Degrees Minutes Seconds	42°53'46.3000", -072°39'46.0000"
UTM	18T 690827mE 4751937mN
UTM centimeter	18T 690827.48mE 4751937.50mN
MGRS	18TXN9082751937
Grid North	1.6°
GARS	215MB25
Maidenhead	FN32QV05LC20
GEOREF	HJCN20235377

Exhibit 6
Tabulation of Proposed Allocation

Blue Text indicates contour protection studies toward select allocation concern(s) as included in ***Exhibit(s) 7(a-b).***

Yellow Highlighted Text denotes the existence of a C.F.R. Section 74.1204(d) Second/Third Adjacent Channel Given Interference Waiver Request toward WTHK(FM) - Wilmington, VT (CH264A). The Interference Contour at the proposed Translator site has been calculated to be no less than the 103.04 dBµ F(50:10) interference contour corresponding to the worst case protected contour at the Translator site. This represents the proposed interference contour which falls wholly within the 40:1 dB ratio. As seen in the ***Exhibit 8*** Aerial Photograph, there is a lack of population, housing, buildings or major roads within this interference contour. The applicant would like to note the existence of the dedicated transmitter building located at the base of the tower. However, structures of this nature have been exempt as a matter of FCC Policy.

Saga Communications Of New England, Inc.

REFERENCE CH# 262D - 100.3 MHz, Pwr= 0.25 kW DA, HAAT= 146.9 M, COR= 483 M DISPLAY DATES
42 53 46.0 N. Average Protected F(50-50)= 15.7 km DATA 03-15-17
72 39 48.0 W. Standard Directional SEARCH 03-15-17

CH CITY	CALL STATE	TYPE ANT	AZI <--	DIST FILE #	LAT LNG	PWR(kW) HAAT(M)	INT(km) COR(M)	PRO(km) LICENSEE	*IN* (Overlap in km)	*OUT*
262D Brattleboro	W262CL VT	LIC DC_	216.6 36.6	0.03 BMLFT20140422AAQ	42 53 45.0 72 39 49.0	0.105 146	8.1 483	1.9 Saga Communications Of New	-15.1*	-25.6*
262B1 Warrensburg Notified to Canada 960805	WFFG-FM NY	LIC _CN	303.6 122.8	106.37 BLH19950606KC	43 25 12.0 73 45 39.0	1.450 400	113.9 680	50.9 6 Johnson Road Licenses, I	-12.8*<	34.9
264A Wilmington	WTHK VT	LIC _C_	288.5 108.3	22.25 BLH19991215ABK	42 57 33.0 72 55 22.0	0.130 452	0.8 1107	26.4 Great Eastern Radio, Llc	15.8	-4.8*<
259D W259AB Marlboro, Etc. Translator for WVAY, Willmington, VT-Horizontal Polarization Only	VT	LIC _HN	246.0 66.0	11.69 BLFT19930126TE	42 51 12.0 72 47 40.0	0.006 187	0.2 687	8.5 Brian Dodge D/b/a Harvest	4.4	2.1
261A WUPE-FM North Adams	MA	LIC NCX	236.3 56.0	39.46 BLH20151014ABU	42 41 54.0 73 03 54.0	1.150 159	28.5 677	19.4 Berkshire Broadcasting Co.	3.9	9.9
262B WHEB Portsmouth	NH	LIC _CN	82.9 264.2	155.17 BLH19910307KE	43 03 11.0 70 46 04.0	50.000 140	135.2 151	62.5 Capstar Tx, Llc	5.3	28.6
263C3 WXXK Lebanon	NH	LIC NCN	19.3 199.6	89.48 BLH19970307KF	43 39 18.0 72 17 42.0	22.000 99	71.4 375	48.4 Great Eastern Radio, Llc	9.6	29.1
260A WFNX Athol	MA	LIC _CN	131.5 311.8	50.54 BLH19891204KC	42 35 39.0 72 12 02.0	1.850 124	2.2 396	25.0 County Broadcasting Compan	24.4	24.4
265A WRNX Amherst	MA	LIC ZEX	178.8 358.8	71.63 BLH20120110ADN	42 15 07.0 72 38 41.0	0.870 262	1.9 364	30.6 Cc Licenses, Llc	54.8	39.9
263B WRCH New Britain	CT	LIC _CX	186.0 5.9	133.31 BMLH20090430AAN	41 42 13.0 72 49 57.0	7.500 381	80.7 475	67.8 Cbs Radio Stations Inc.	40.7	40.4
208B WVPR Windsor	VT	LIC _CX	15.8 195.9	62.54 BMLED20120821ABT	43 26 15.0 72 27 08.0	1.700 694	5.5 975	1.8 Vermont Public Radio	14.5R	48.0M
259A WNTK-FM New London	NH	LIC ZCX	39.5 220.0	79.76 BLH20011114ABD	43 26 52.0 72 02 04.0	1.450 206	2.3 582	30.8 Sugar River Media, Llc	68.8	48.7
259A WNTK-FM New London	NH	APP ZCX	39.5 219.9	79.80 BMLH20161013AAW	43 26 54.0 72 02 04.0	1.450 206	2.3 582	30.8 Sugar River Media, Llc	68.9	48.8

Terrain database is FCC NGDC 30 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.
< = Contour Overlap

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

Saga Communications Of New England, Inc.

FMCommander Single Allocation Study - 03-15-2017 - FCC NGDC 30 Sec
W262CL.P's Overlaps (In= 4.43 km, Out= 2.09 km)

W262CL.P CH 262 D DA
Lat= 42 53 46.0, Lng= 72 39 48.0
0.25 kW 146.9 m HAAT, 483 m COR
Prot.= 60 dBu, Intef.= 100 dBu

W259AB CH 259 D BLFT19930126TE
Lat= 42 51 12.0, Lng= 72 47 40.0
0.006 kW 187 m HAAT, 687 m COR
Prot.= 60 dBu, Intef.= 100 dBu

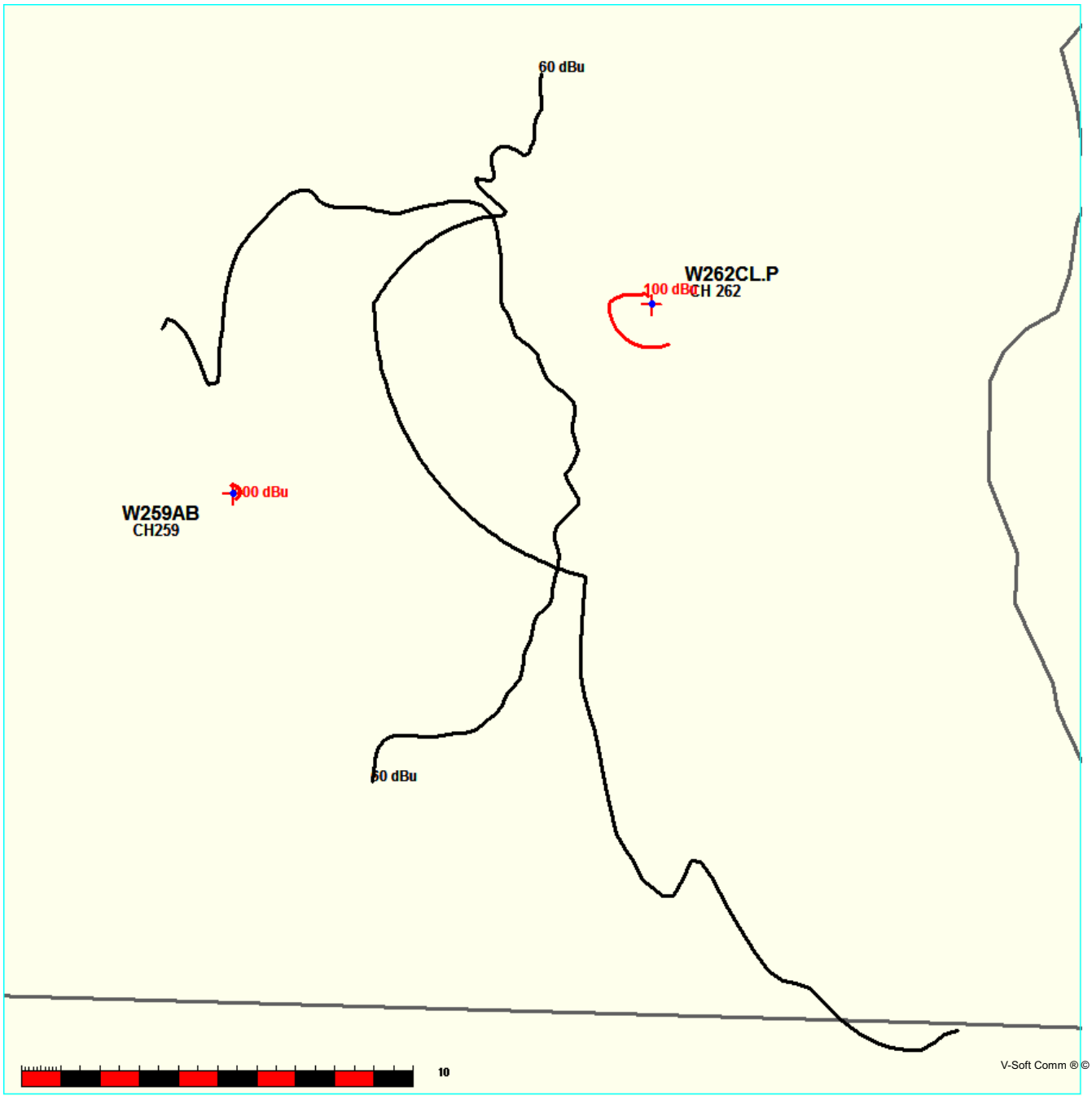

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Exhibit 7a
Contour Protection Studies Toward Select Allocation Concern(s)

03-15-2017 Terrain Data: FCC NGDC 30 Sec FMOver Analysis

W262CL.P

Channel = 262D
Max ERP = 0.25 kW
RCAMSL = 483 m
N. Lat. 42 53 46.0
W. Lng. 72 39 48.0
Protected
60 dBu

W259AB BLFT19930126TE

Channel = 259D
Max ERP = 0.006 kW
RCAMSL = 687 m
N. Lat. 42 51 12.0
W. Lng. 72 47 40.0
Interfering
100 dBu

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)	IX (km)
203.0	000.2500	-0012.2	007.1	102.6	000.0060	0277.2	008.1	60.67	
204.0	000.2500	-0013.7	007.1	102.4	000.0060	0277.0	008.0	60.89	
205.0	000.2500	-0015.9	007.1	102.2	000.0060	0276.9	007.9	61.12	
206.0	000.2500	-0016.5	007.1	102.0	000.0060	0276.8	007.8	61.34	
207.0	000.2500	-0014.2	007.1	101.8	000.0060	0276.6	007.6	61.57	
208.0	000.2500	-0009.7	007.1	101.5	000.0060	0276.3	007.5	61.79	
209.0	000.2500	-0005.3	007.1	101.2	000.0060	0275.9	007.4	62.02	
210.0	000.2500	-0002.1	007.1	100.9	000.0060	0275.5	007.3	62.24	
211.0	000.2500	0001.5	007.1	100.6	000.0060	0274.7	007.2	62.46	
212.0	000.2500	0007.0	007.1	100.3	000.0060	0273.4	007.0	62.67	
213.0	000.2500	0013.2	007.1	099.9	000.0060	0271.5	006.9	62.85	
214.0	000.2500	0018.0	007.1	099.5	000.0060	0269.2	006.8	63.03	
215.0	000.2500	0020.1	007.1	099.0	000.0060	0267.0	006.7	63.21	
216.0	000.2500	0018.8	007.1	098.5	000.0060	0265.2	006.6	63.41	
217.0	000.2500	0014.4	007.1	098.0	000.0060	0263.9	006.5	63.61	
218.0	000.2500	0009.0	007.1	097.5	000.0060	0263.1	006.4	63.83	
219.0	000.2500	0005.3	007.1	096.9	000.0060	0262.7	006.3	64.06	
220.0	000.2500	0003.8	007.1	096.3	000.0060	0263.7	006.2	64.32	
221.0	000.2500	0002.8	007.1	095.6	000.0060	0267.7	006.1	64.64	
222.0	000.2500	0001.1	007.1	094.9	000.0060	0273.1	006.0	65.00	
223.0	000.2500	-0001.5	007.1	094.2	000.0060	0279.2	005.9	65.35	
224.0	000.2500	-0005.1	007.1	093.4	000.0060	0285.8	005.8	65.70	
225.0	000.2500	-0009.9	007.1	092.6	000.0060	0292.8	005.7	66.04	
226.0	000.2500	-0015.7	007.1	091.7	000.0060	0299.7	005.6	66.35	
227.0	000.2500	-0021.7	007.1	090.8	000.0060	0296.4	005.5	66.50	
228.0	000.2500	-0025.7	007.1	089.9	000.0060	0290.7	005.4	66.60	
229.0	000.2500	-0026.9	007.1	088.9	000.0060	0284.7	005.3	66.69	
230.0	000.2500	-0026.1	007.1	087.8	000.0060	0278.2	005.3	66.75	
231.0	000.2500	-0024.7	007.1	086.7	000.0060	0278.8	005.2	66.94	
232.0	000.2500	-0024.2	007.1	085.6	000.0060	0286.7	005.1	67.25	
233.0	000.2500	-0024.8	007.1	084.4	000.0060	0294.8	005.0	67.53	
234.0	000.2500	-0025.7	007.1	083.2	000.0060	0301.6	005.0	67.77	
235.0	000.2500	-0027.0	007.1	082.0	000.0060	0300.3	004.9	67.90	
236.0	000.2500	-0029.1	007.1	080.7	000.0060	0298.0	004.9	67.99	

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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)
237.0	000.2500	-0032.2	007.1	079.3	000.0060	0297.4	004.8	68.10
238.0	000.2500	-0036.3	007.1	077.9	000.0060	0303.2	004.8	68.28
239.0	000.2500	-0041.1	007.1	076.5	000.0060	0308.9	004.7	68.44
240.0	000.2500	-0046.8	007.1	075.1	000.0060	0308.8	004.7	68.53
241.0	000.2500	-0053.2	007.1	073.6	000.0060	0299.1	004.7	68.48
242.0	000.2500	-0059.8	007.1	072.1	000.0060	0287.7	004.6	68.39
243.0	000.2500	-0064.9	007.1	070.6	000.0060	0279.8	004.6	68.32
244.0	000.2500	-0067.4	007.1	069.1	000.0060	0276.2	004.6	68.30
245.0	000.2500	-0067.4	007.1	067.6	000.0060	0276.7	004.6	68.33
246.0	000.2500	-0066.3	007.1	066.0	000.0060	0277.6	004.6	68.36
247.0	000.2500	-0064.4	007.1	064.5	000.0060	0274.7	004.6	68.30
248.0	000.2500	-0061.8	007.1	063.0	000.0060	0266.8	004.6	68.16
249.0	000.2500	-0058.5	007.1	061.4	000.0060	0261.1	004.6	68.03
250.0	000.2500	-0054.7	007.1	059.9	000.0060	0261.9	004.6	67.99
251.0	000.2500	-0051.7	007.1	058.4	000.0060	0265.3	004.7	67.98
252.0	000.2500	-0049.6	007.1	057.0	000.0060	0265.9	004.7	67.91
253.0	000.2500	-0047.6	007.1	055.5	000.0060	0267.0	004.7	67.84
254.0	000.2500	-0045.0	007.1	054.1	000.0060	0273.1	004.8	67.85
255.0	000.2500	-0042.9	007.1	052.7	000.0060	0283.0	004.8	67.90
256.0	000.2500	-0041.5	007.1	051.4	000.0060	0293.7	004.9	67.94
257.0	000.2500	-0040.9	007.1	050.1	000.0060	0305.5	004.9	67.97
258.0	000.2500	-0041.1	007.1	048.8	000.0060	0317.3	005.0	67.97
259.0	000.2500	-0042.4	007.1	047.6	000.0060	0327.7	005.0	67.95
260.0	000.2500	-0042.7	007.1	046.4	000.0060	0336.8	005.1	67.89
261.0	000.2500	-0042.2	007.1	045.3	000.0060	0346.0	005.2	67.83
262.0	000.2500	-0041.4	007.1	044.2	000.0060	0353.8	005.3	67.74
263.0	000.2500	-0040.7	007.1	043.1	000.0060	0358.5	005.3	67.61
264.0	000.2500	-0039.6	007.1	042.1	000.0060	0359.6	005.4	67.44
265.0	000.2500	-0035.9	007.1	041.2	000.0060	0358.0	005.5	67.23
266.0	000.2500	-0030.2	007.1	040.3	000.0060	0354.4	005.6	67.00
267.0	000.2500	-0025.3	007.1	039.4	000.0060	0349.4	005.7	66.76
268.0	000.2500	-0020.4	007.1	038.6	000.0060	0342.9	005.8	66.49
269.0	000.2500	-0017.1	007.1	037.8	000.0060	0335.3	005.9	66.20
270.0	000.2500	-0013.8	007.1	037.1	000.0060	0326.7	006.0	65.89
271.0	000.2401	-0010.6	007.0	036.9	000.0060	0325.1	006.1	65.56
272.0	000.2304	-0007.7	006.9	036.8	000.0060	0323.7	006.2	65.25
273.0	000.2209	-0006.5	006.9	036.7	000.0060	0322.7	006.4	64.95
274.0	000.2116	-0006.6	006.8	036.7	000.0060	0322.2	006.5	64.67
275.0	000.2025	-0008.2	006.7	036.7	000.0060	0322.2	006.7	64.39
276.0	000.1936	-0011.5	006.7	036.7	000.0060	0322.6	006.8	64.12
277.0	000.1849	-0014.5	006.6	036.8	000.0060	0323.5	006.9	63.87
278.0	000.1764	-0016.8	006.5	036.9	000.0060	0324.7	007.1	63.63
279.0	000.1681	-0018.7	006.4	037.0	000.0060	0325.9	007.2	63.40
280.0	000.1600	-0020.3	006.3	037.1	000.0060	0327.5	007.3	63.17

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

03-15-2017 Terrain Data: FCC NGDC 30 Sec FMOver Analysis

W259AB BLFT19930126TE	W262CL.P
Channel = 259D	Channel = 262D
Max ERP = 0.006 kW	Max ERP = 0.25 kW
RCAMSL = 687 m	RCAMSL = 483 m
N. Lat. 42 51 12.0	N. Lat. 42 53 46.0
W. Lng. 72 47 40.0	W. Lng. 72 39 48.0
Protected	Interfering
60 dBu	100 dBu

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)	IX (km)
021.0	000.0060	0229.7	007.7	287.1	000.1083	-0015.6	008.3	53.78	
022.0	000.0060	0232.2	007.7	287.3	000.1068	-0015.0	008.1	53.98	
023.0	000.0060	0235.8	007.8	287.7	000.1045	-0014.1	008.0	54.16	
024.0	000.0060	0240.1	007.9	288.1	000.1018	-0013.2	007.9	54.33	
025.0	000.0060	0242.8	007.9	288.3	000.1005	-0013.0	007.7	54.57	
026.0	000.0060	0244.4	007.9	288.4	000.1001	-0012.9	007.6	54.87	
027.0	000.0060	0246.4	008.0	288.5	000.0995	-0012.8	007.4	55.16	
028.0	000.0060	0249.1	008.0	288.6	000.0985	-0012.6	007.3	55.46	
029.0	000.0060	0251.8	008.1	288.8	000.0975	-0012.3	007.1	55.76	
030.0	000.0060	0255.1	008.1	289.0	000.0960	-0012.0	007.0	56.07	
031.0	000.0060	0260.4	008.2	289.5	000.0930	-0011.3	006.8	56.33	
032.0	000.0060	0268.8	008.3	290.4	000.0876	-0010.2	006.7	56.50	
033.0	000.0060	0280.3	008.5	291.7	000.0799	-0008.1	006.5	56.58	
034.0	000.0060	0291.9	008.7	293.0	000.0728	-0006.2	006.3	56.65	
035.0	000.0060	0302.7	008.9	294.1	000.0670	-0004.9	006.1	56.79	
036.0	000.0060	0313.9	009.0	295.2	000.0614	0000.1	005.9	56.94	
037.0	000.0060	0326.0	009.2	296.5	000.0552	0010.6	005.8	57.03	
038.0	000.0060	0337.4	009.3	297.7	000.0496	0018.9	005.6	57.14	
039.0	000.0060	0346.5	009.4	298.6	000.0456	0022.0	005.4	57.35	
040.0	000.0060	0353.2	009.5	299.2	000.0431	0022.7	005.2	57.68	
041.0	000.0060	0357.5	009.6	299.5	000.0421	0022.9	005.0	58.14	
042.0	000.0060	0359.5	009.6	299.3	000.0427	0022.8	004.9	58.75	
043.0	000.0060	0358.8	009.6	298.8	000.0450	0022.2	004.7	59.52	
044.0	000.0060	0354.9	009.6	297.6	000.0500	0018.5	004.6	60.50	
045.0	000.0060	0348.0	009.5	295.9	000.0580	0005.5	004.4	61.63	
046.0	000.0060	0339.9	009.4	293.9	000.0683	-0005.4	004.3	62.80	
047.0	000.0060	0332.2	009.3	291.7	000.0801	-0008.1	004.2	63.93	
048.0	000.0060	0324.2	009.1	289.4	000.0937	-0011.5	004.1	65.01	
049.0	000.0060	0315.3	009.0	286.8	000.1102	-0016.4	004.0	66.04	
050.0	000.0060	0306.1	008.9	284.1	000.1289	-0022.5	004.0	66.99	
051.0	000.0060	0297.0	008.8	281.3	000.1498	-0022.5	003.9	67.85	
052.0	000.0060	0288.6	008.7	278.5	000.1724	-0017.8	003.9	68.61	
053.0	000.0060	0280.9	008.5	275.7	000.1966	-0010.2	003.9	69.27	

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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)
054.0	000.0060	0273.7	008.4	272.9	000.2218	-0006.6	003.9	69.84
055.0	000.0060	0268.5	008.3	270.4	000.2460	-0012.5	003.8	70.38
056.0	000.0060	0266.1	008.3	268.3	000.2500	-0019.5	003.8	70.67
057.0	000.0060	0265.9	008.3	266.3	000.2500	-0028.5	003.7	71.01
058.0	000.0060	0265.8	008.3	264.3	000.2500	-0038.7	003.7	71.32
059.0	000.0060	0264.1	008.3	262.1	000.2500	-0041.4	003.6	71.50
060.0	000.0060	0261.7	008.2	259.7	000.2500	-0042.7	003.6	71.57
061.0	000.0060	0260.6	008.2	257.5	000.2500	-0040.9	003.6	71.70
062.0	000.0060	0262.5	008.2	255.4	000.2500	-0042.3	003.5	72.04
063.0	000.0060	0267.1	008.3	253.3	000.2500	-0047.0	003.4	72.55
064.0	000.0060	0272.6	008.4	251.0	000.2500	-0051.7	003.3	73.12
065.0	000.0060	0276.1	008.5	248.6	000.2500	-0060.0	003.2	73.49
066.0	000.0060	0277.6	008.5	245.9	000.2500	-0066.4	003.2	73.64
067.0	000.0060	0277.2	008.5	243.3	000.2500	-0066.0	003.2	73.57
068.0	000.0060	0276.4	008.5	240.7	000.2500	-0051.2	003.2	73.43
069.0	000.0060	0276.1	008.5	238.1	000.2500	-0036.9	003.3	73.28
070.0	000.0060	0277.6	008.5	235.5	000.2500	-0028.0	003.3	73.23
071.0	000.0060	0281.5	008.6	232.7	000.2500	-0024.6	003.3	73.32
072.0	000.0060	0286.8	008.6	229.7	000.2500	-0026.5	003.2	73.45
073.0	000.0060	0294.2	008.7	226.5	000.2500	-0018.6	003.2	73.65
074.0	000.0060	0302.0	008.9	223.1	000.2500	-0001.9	003.2	73.77
075.0	000.0060	0308.4	008.9	219.9	000.2500	0003.9	003.2	73.69
076.0	000.0060	0310.1	009.0	217.5	000.2500	0011.6	003.3	73.29
077.0	000.0060	0307.4	008.9	215.8	000.2500	0019.3	003.4	72.63
078.0	000.0060	0302.9	008.9	214.6	000.2500	0019.6	003.5	71.89
079.0	000.0060	0298.3	008.8	213.5	000.2500	0016.1	003.7	71.14
080.0	000.0060	0297.2	008.8	212.1	000.2500	0007.7	003.8	70.57
081.0	000.0060	0298.4	008.8	210.4	000.2500	-0000.7	003.9	70.08
082.0	000.0060	0300.4	008.8	208.8	000.2500	-0006.2	004.0	69.62
083.0	000.0060	0301.7	008.8	207.3	000.2500	-0013.0	004.1	69.13
084.0	000.0060	0298.0	008.8	206.7	000.2500	-0015.2	004.3	68.48
085.0	000.0060	0290.9	008.7	206.8	000.2500	-0014.9	004.5	67.76
086.0	000.0060	0284.1	008.6	206.9	000.2500	-0014.5	004.7	67.09
087.0	000.0060	0277.3	008.5	207.1	000.2500	-0013.7	004.9	66.48
088.0	000.0060	0279.3	008.5	206.0	000.2500	-0016.5	005.0	66.11
089.0	000.0060	0285.5	008.6	204.2	000.2500	-0014.2	005.1	65.81
090.0	000.0060	0291.5	008.7	202.6	000.2500	-0012.1	005.2	65.48
091.0	000.0060	0297.4	008.8	201.1	000.2500	-0012.4	005.3	65.13
092.0	000.0060	0298.0	008.8	200.5	000.2500	-0011.6	005.4	64.67
093.0	000.0060	0289.3	008.7	201.2	000.2500	-0012.5	005.6	64.10
094.0	000.0060	0280.8	008.5	202.0	000.2500	-0012.2	005.8	63.53
095.0	000.0060	0272.5	008.4	202.8	000.2500	-0012.1	006.0	62.99
096.0	000.0060	0265.0	008.3	203.5	000.2500	-0012.8	006.1	62.49
097.0	000.0060	0262.7	008.2	203.5	000.2500	-0012.7	006.3	62.07
098.0	000.0060	0263.8	008.3	202.9	000.2500	-0012.2	006.4	61.71

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

Saga Communications Of New England, Inc.

FMCommander Single Allocation Study - 03-15-2017 - FCC NGDC 30 Sec
W262CL.P's Overlaps (In= 3.89 km, Out= 9.95 km)

W262CL.P CH 262 D DA
Lat= 42 53 46.0, Lng= 72 39 48.0
0.25 kW 146.9 m HAAT, 483 m COR
Prot.= 60 dBu, Intef.= 54 dBu

WUPE-FM CH 261 A 73.215 N BLH20151014ABU
Lat= 42 41 54.0, Lng= 73 03 54.0
1.15 kW 158.8 m HAAT, 677.3 m COR
Prot.= 60 dBu, Intef.= 54 dBu

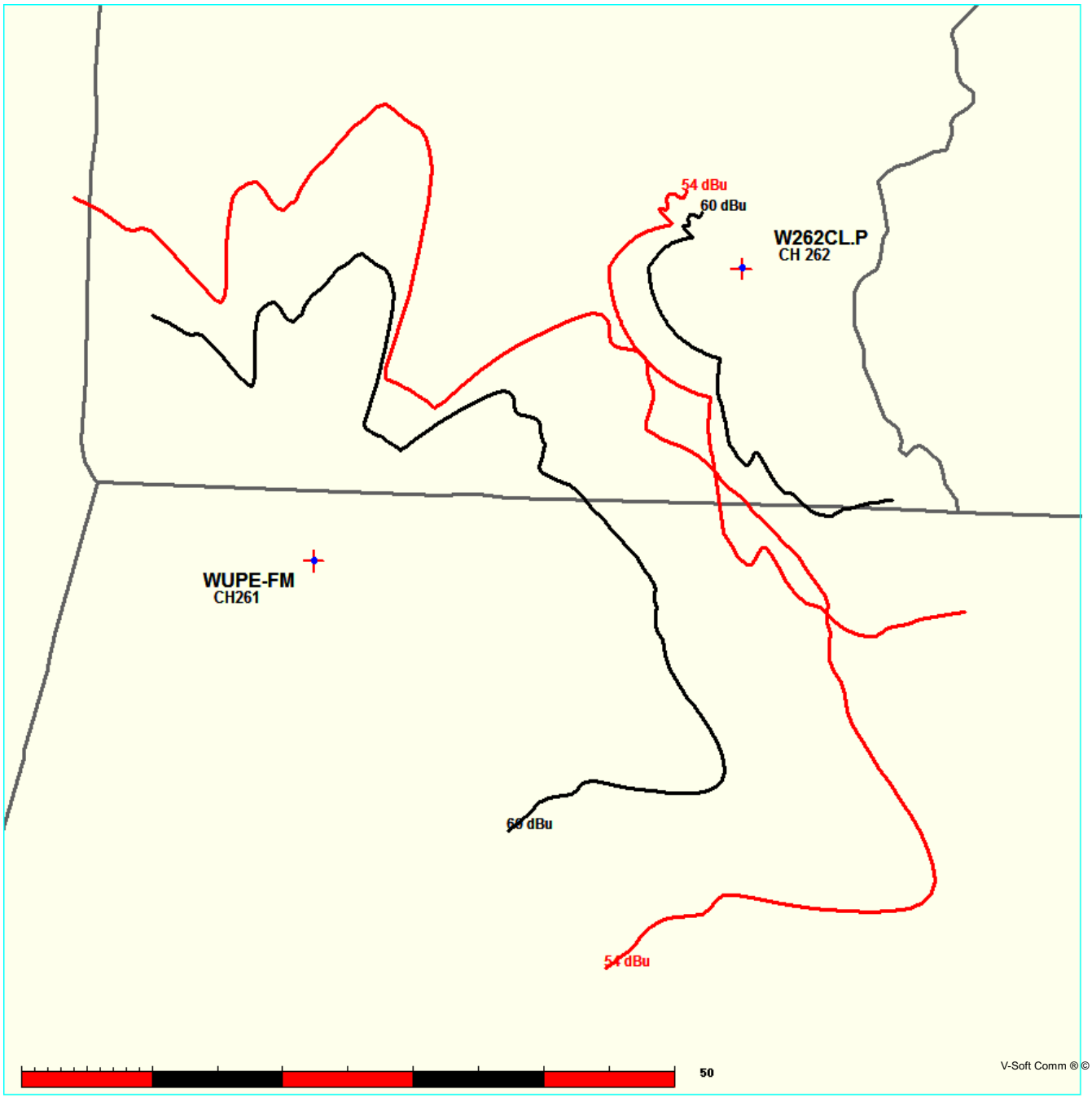

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Exhibit 7b
Contour Protection Studies Toward Select Allocation Concern(s)

W262CL.P

Channel = 262D
Max ERP = 0.25 kW
RCAMSL = 483 m
N. Lat. 42 53 46.0
W. Lng. 72 39 48.0
Protected
60 dBu

WUPE-FM BLH20151014ABU

Channel = 261A
Max ERP = 1.15 kW
RCAMSL = 677.3 m
N. Lat. 42 41 54.0
W. Lng. 73 03 54.0
Interfering
54 dBu

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)	IX (km)
193.0	000.2500	0036.8	007.8	065.0	001.1500	0101.9	034.2	51.11	
194.0	000.2500	0027.8	007.1	063.9	001.1500	0103.7	034.5	51.11	
195.0	000.2500	0018.8	007.1	063.8	001.1500	0103.8	034.5	51.16	
196.0	000.2500	0010.6	007.1	063.7	001.1500	0103.9	034.4	51.21	
197.0	000.2500	0004.2	007.1	063.5	001.1500	0104.0	034.3	51.26	
198.0	000.2500	-0001.0	007.1	063.4	001.1500	0104.0	034.2	51.31	
199.0	000.2500	-0005.7	007.1	063.2	001.1500	0104.1	034.1	51.35	
200.0	000.2500	-0010.2	007.1	063.1	001.1500	0104.1	034.0	51.39	
201.0	000.2500	-0012.4	007.1	062.9	001.1500	0104.2	033.9	51.44	
202.0	000.2500	-0012.2	007.1	062.8	001.1500	0104.2	033.8	51.48	
203.0	000.2500	-0012.2	007.1	062.6	001.1500	0104.3	033.8	51.53	
204.0	000.2500	-0013.7	007.1	062.5	001.1500	0104.3	033.7	51.56	
205.0	000.2500	-0015.9	007.1	062.3	001.1500	0104.4	033.6	51.61	
206.0	000.2500	-0016.5	007.1	062.1	001.1500	0104.5	033.5	51.65	
207.0	000.2500	-0014.2	007.1	061.9	001.1500	0104.6	033.5	51.69	
208.0	000.2500	-0009.7	007.1	061.8	001.1500	0104.6	033.4	51.73	
209.0	000.2500	-0005.3	007.1	061.6	001.1500	0104.8	033.3	51.77	
210.0	000.2500	-0002.1	007.1	061.4	001.1500	0105.0	033.3	51.82	
211.0	000.2500	0001.5	007.1	061.2	001.1500	0105.2	033.2	51.87	
212.0	000.2500	0007.0	007.1	061.0	001.1500	0105.4	033.1	51.92	
213.0	000.2500	0013.2	007.1	060.9	001.1500	0105.8	033.1	51.98	
214.0	000.2500	0018.0	007.1	060.7	001.1500	0106.1	033.0	52.04	
215.0	000.2500	0020.1	007.1	060.5	001.1500	0106.4	033.0	52.09	
216.0	000.2500	0018.8	007.1	060.3	001.1500	0106.8	032.9	52.14	
217.0	000.2500	0014.4	007.1	060.1	001.1500	0107.1	032.9	52.19	
218.0	000.2500	0009.0	007.1	059.9	001.1500	0107.4	032.8	52.24	
219.0	000.2500	0005.3	007.1	059.7	001.1500	0107.8	032.8	52.30	
220.0	000.2500	0003.8	007.1	059.5	001.1500	0108.1	032.7	52.34	
221.0	000.2500	0002.8	007.1	059.3	001.1500	0108.3	032.7	52.37	
222.0	000.2500	0001.1	007.1	059.1	001.1500	0108.4	032.6	52.40	
223.0	000.2500	-0001.5	007.1	058.9	001.1500	0108.3	032.6	52.41	
224.0	000.2500	-0005.1	007.1	058.7	001.1500	0108.2	032.6	52.42	
225.0	000.2500	-0009.9	007.1	058.4	001.1500	0108.0	032.5	52.42	
226.0	000.2500	-0015.7	007.1	058.2	001.1500	0107.6	032.5	52.40	

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)
227.0	000.2500	-0021.7	007.1	058.0	001.1500	0107.1	032.5	52.37
228.0	000.2500	-0025.7	007.1	057.8	001.1500	0106.7	032.5	52.35
229.0	000.2500	-0026.9	007.1	057.6	001.1500	0106.2	032.4	52.31
230.0	000.2500	-0026.1	007.1	057.4	001.1500	0105.4	032.4	52.26
231.0	000.2500	-0024.7	007.1	057.2	001.1500	0104.6	032.4	52.20
232.0	000.2500	-0024.2	007.1	056.9	001.1500	0103.9	032.4	52.14
233.0	000.2500	-0024.8	007.1	056.7	001.1500	0103.2	032.4	52.09
234.0	000.2500	-0025.7	007.1	056.5	001.1500	0102.5	032.4	52.03
235.0	000.2500	-0027.0	007.1	056.3	001.1500	0101.8	032.4	51.97
236.0	000.2500	-0029.1	007.1	056.1	001.1500	0101.1	032.4	51.90
237.0	000.2500	-0032.2	007.1	055.8	001.1500	0100.3	032.4	51.84
238.0	000.2500	-0036.3	007.1	055.6	001.1500	0099.6	032.4	51.77
239.0	000.2500	-0041.1	007.1	055.4	001.1500	0098.8	032.4	51.70
240.0	000.2500	-0046.8	007.1	055.2	001.1500	0098.3	032.4	51.64
241.0	000.2500	-0053.2	007.1	055.0	001.1500	0097.9	032.4	51.60
242.0	000.2500	-0059.8	007.1	054.8	001.1500	0097.8	032.4	51.58
243.0	000.2500	-0064.9	007.1	054.5	001.1500	0097.6	032.4	51.56
244.0	000.2500	-0067.4	007.1	054.3	001.1500	0097.5	032.5	51.54
245.0	000.2500	-0067.4	007.1	054.1	001.1500	0097.6	032.5	51.54
246.0	000.2500	-0066.3	007.1	053.9	001.1500	0097.9	032.5	51.55
247.0	000.2500	-0064.4	007.1	053.7	001.1500	0098.2	032.5	51.57
248.0	000.2500	-0061.8	007.1	053.5	001.1500	0098.5	032.6	51.59
249.0	000.2500	-0058.5	007.1	053.3	001.1500	0099.0	032.6	51.62
250.0	000.2500	-0054.7	007.1	053.0	001.1500	0099.4	032.6	51.64
251.0	000.2500	-0051.7	007.1	052.8	001.1500	0099.8	032.7	51.65
252.0	000.2500	-0049.6	007.1	052.6	001.1500	0100.4	032.7	51.69
253.0	000.2500	-0047.6	007.1	052.4	001.1500	0101.0	032.7	51.73
254.0	000.2500	-0045.0	007.1	052.2	001.1500	0101.4	032.8	51.74
255.0	000.2500	-0042.9	007.1	052.0	001.1500	0101.9	032.8	51.76
256.0	000.2500	-0041.5	007.1	051.8	001.1500	0102.2	032.9	51.77
257.0	000.2500	-0040.9	007.1	051.6	001.1500	0102.5	032.9	51.77
258.0	000.2500	-0041.1	007.1	051.4	001.1500	0102.8	033.0	51.76
259.0	000.2500	-0042.4	007.1	051.2	001.1500	0102.9	033.0	51.75
260.0	000.2500	-0042.7	007.1	051.1	001.1500	0102.9	033.1	51.73
261.0	000.2500	-0042.2	007.1	050.9	001.1500	0103.0	033.2	51.70
262.0	000.2500	-0041.4	007.1	050.7	001.1500	0103.0	033.2	51.67
263.0	000.2500	-0040.7	007.1	050.5	001.1500	0102.9	033.3	51.63
264.0	000.2500	-0039.6	007.1	050.3	001.1500	0102.7	033.4	51.59
265.0	000.2500	-0035.9	007.1	050.1	001.1500	0102.5	033.4	51.53
266.0	000.2500	-0030.2	007.1	050.0	001.1500	0102.1	033.5	51.47
267.0	000.2500	-0025.3	007.1	049.8	001.1500	0101.7	033.6	51.40
268.0	000.2500	-0020.4	007.1	049.6	001.1500	0101.2	033.6	51.32
269.0	000.2500	-0017.1	007.1	049.5	001.1500	0100.9	033.7	51.25
270.0	000.2500	-0013.8	007.1	049.3	001.1500	0100.5	033.8	51.18
271.0	000.2500	-0010.6	007.1	049.2	001.1500	0100.1	033.9	51.11

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

03-15-2017 Terrain Data: FCC NGDC 30 Sec FMOver Analysis

WUPE-FM BLH20151014ABU	W262CL.P
Channel = 261A	Channel = 262D
Max ERP = 1.15 kW	Max ERP = 0.25 kW
RCAMSL = 677.3 m	RCAMSL = 483 m
N. Lat. 42 41 54.0	N. Lat. 42 53 46.0
W. Lng. 73 03 54.0	W. Lng. 72 39 48.0
Protected	Interfering
60 dBu	54 dBu

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)	IX (km)
011.0	001.1500	0143.4	022.9	271.0	000.2400	-0010.5	028.4	36.91	
012.0	001.1500	0141.2	022.7	270.5	000.2447	-0012.1	028.0	37.19	
013.0	001.1500	0139.8	022.6	270.2	000.2485	-0013.3	027.6	37.47	
014.0	001.1500	0138.0	022.5	269.7	000.2500	-0014.9	027.3	37.70	
015.0	001.1500	0133.7	022.1	268.8	000.2500	-0017.7	027.0	37.87	
016.0	001.1500	0126.7	021.6	267.5	000.2500	-0022.6	026.8	38.00	
017.0	001.1500	0116.1	020.8	265.6	000.2500	-0032.6	026.7	38.03	
018.0	001.1500	0099.8	019.3	262.3	000.2500	-0041.3	027.0	37.85	
019.0	001.1500	0079.2	016.9	257.7	000.2500	-0041.0	027.9	37.36	
020.0	001.1500	0056.3	014.2	252.9	000.2500	-0047.8	029.2	36.64	
021.0	001.1500	0032.4	010.9	247.8	000.2500	-0062.4	031.2	35.68	
022.0	001.1500	0007.0	010.5	247.1	000.2500	-0064.2	031.3	35.63	
023.0	001.1500	-0018.7	010.5	246.9	000.2500	-0064.7	031.2	35.69	
024.0	001.1500	-0040.3	010.5	246.6	000.2500	-0065.2	031.1	35.74	
025.0	001.1500	-0054.1	010.5	246.4	000.2500	-0065.7	030.9	35.80	
026.0	001.1500	-0060.5	010.5	246.1	000.2500	-0066.1	030.8	35.85	
027.0	001.1500	-0061.1	010.5	245.8	000.2500	-0066.5	030.7	35.90	
028.0	001.1500	-0054.7	010.5	245.6	000.2500	-0066.8	030.6	35.95	
029.0	001.1500	-0043.3	010.5	245.3	000.2500	-0067.2	030.5	36.00	
030.0	001.1500	-0031.6	010.5	245.0	000.2500	-0067.4	030.4	36.05	
031.0	001.1500	-0021.6	010.5	244.7	000.2500	-0067.6	030.3	36.10	
032.0	001.1500	-0014.5	010.5	244.4	000.2500	-0067.7	030.2	36.15	
033.0	001.1500	-0011.1	010.5	244.1	000.2500	-0067.5	030.1	36.20	
034.0	001.1500	-0010.8	010.5	243.8	000.2500	-0067.2	030.0	36.24	
035.0	001.1500	-0009.6	010.5	243.5	000.2500	-0066.7	029.9	36.28	
036.0	001.1500	-0004.8	010.5	243.2	000.2500	-0065.7	029.8	36.33	
037.0	001.1500	0004.1	010.5	242.9	000.2500	-0064.5	029.7	36.37	
038.0	001.1500	0014.9	010.5	242.6	000.2500	-0062.9	029.6	36.40	
039.0	001.1500	0024.9	010.5	242.2	000.2500	-0061.2	029.6	36.44	
040.0	001.1500	0032.9	010.9	242.2	000.2500	-0061.1	029.1	36.68	
041.0	001.1500	0039.9	012.0	242.6	000.2500	-0063.1	028.1	37.24	
042.0	001.1500	0047.0	013.0	242.9	000.2500	-0064.7	027.0	37.84	
043.0	001.1500	0055.0	014.1	243.3	000.2500	-0065.9	026.0	38.52	

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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)
044.0	001.1500	0062.6	014.9	243.4	000.2500	-0066.4	025.0	39.12
045.0	001.1500	0069.6	015.8	243.4	000.2500	-0066.4	024.2	39.70
046.0	001.1500	0077.4	016.7	243.5	000.2500	-0066.6	023.2	40.41
047.0	001.1500	0085.8	017.7	243.5	000.2500	-0066.6	022.1	41.18
048.0	001.1500	0093.6	018.6	243.3	000.2500	-0066.0	021.2	41.89
049.0	001.1500	0099.7	019.2	242.8	000.2500	-0064.3	020.5	42.44
050.0	001.1500	0102.2	019.5	242.1	000.2500	-0060.2	020.2	42.70
051.0	001.1500	0103.0	019.6	241.2	000.2500	-0054.3	020.0	42.81
052.0	001.1500	0101.9	019.5	240.2	000.2500	-0047.7	020.1	42.77
053.0	001.1500	0099.5	019.2	239.1	000.2500	-0041.8	020.3	42.60
054.0	001.1500	0097.7	019.0	238.1	000.2500	-0036.9	020.4	42.48
055.0	001.1500	0097.9	019.1	237.2	000.2500	-0033.0	020.4	42.51
056.0	001.1500	0100.9	019.4	236.3	000.2500	-0029.8	020.1	42.76
057.0	001.1500	0104.1	019.7	235.3	000.2500	-0027.5	019.8	43.01
058.0	001.1500	0107.1	020.0	234.2	000.2500	-0026.0	019.5	43.23
059.0	001.1500	0108.4	020.1	233.2	000.2500	-0024.9	019.4	43.30
060.0	001.1500	0107.2	020.0	232.2	000.2500	-0024.3	019.6	43.18
061.0	001.1500	0105.5	019.8	231.3	000.2500	-0024.5	019.8	43.00
062.0	001.1500	0104.5	019.7	230.3	000.2500	-0025.5	019.9	42.88
063.0	001.1500	0104.2	019.7	229.4	000.2500	-0026.8	020.1	42.79
064.0	001.1500	0103.7	019.7	228.5	000.2500	-0026.8	020.2	42.68
065.0	001.1500	0101.9	019.5	227.7	000.2500	-0024.8	020.5	42.47
066.0	001.1500	0099.0	019.2	227.1	000.2500	-0022.1	020.8	42.16
067.0	001.1500	0096.4	018.9	226.5	000.2500	-0018.7	021.2	41.88
068.0	001.1500	0093.8	018.6	225.9	000.2500	-0015.4	021.6	41.59
069.0	001.1500	0093.2	018.6	225.2	000.2500	-0011.1	021.8	41.44
070.0	001.1500	0095.3	018.8	224.2	000.2500	-0005.9	021.7	41.50
071.0	001.1500	0097.9	019.1	223.1	000.2500	-0001.8	021.6	41.57
072.0	001.1500	0101.6	019.4	221.8	000.2500	0001.5	021.4	41.70
073.0	001.1500	0106.2	019.9	220.4	000.2500	0003.4	021.2	41.85
074.0	001.1500	0110.4	020.3	219.0	000.2500	0005.4	021.1	41.96
075.0	001.1500	0113.8	020.6	217.7	000.2500	0010.3	021.1	41.98
076.0	001.1500	0116.6	020.8	216.6	000.2500	0016.7	021.1	41.95
077.0	001.1500	0119.9	021.1	215.3	000.2500	0020.0	021.2	41.92
078.0	001.1500	0122.8	021.3	214.2	000.2500	0018.7	021.3	41.85
079.0	001.1500	0124.3	021.4	213.3	000.2500	0014.7	021.4	41.71
080.0	001.1500	0127.0	021.6	212.2	000.2500	0008.3	021.6	41.61
081.0	001.1500	0131.5	022.0	210.9	000.2500	0001.0	021.6	41.55
082.0	001.1500	0135.6	022.3	209.6	000.2500	-0003.2	021.8	41.47
083.0	001.1500	0138.4	022.5	208.6	000.2500	-0007.1	021.9	41.32
084.0	001.1500	0141.5	022.7	207.5	000.2500	-0012.1	022.1	41.18
085.0	001.1500	0146.8	023.1	206.1	000.2500	-0016.5	022.3	41.07
086.0	001.1500	0151.5	023.4	204.9	000.2500	-0015.6	022.5	40.93
087.0	001.1500	0155.7	023.7	203.7	000.2500	-0013.2	022.7	40.76

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Yellow Highlighted Text denotes the existence of a C.F.R. Section 74.1204(d) Second/ Third Adjacent Channel Given Interference Waiver Request toward WTHK(FM) - Wilmington, VT (CH264A). The Interference Contour at the proposed Translator site has been calculated to be no less than the 103.04 dBµ F(50:10) interference contour corresponding to the worst case protected contour at the Translator site. This represents the proposed interference contour which falls wholly within the 40:1 dB ratio. As seen in the ***Exhibit 8*** Aerial Photograph, there is a lack of population, housing, buildings or major roads within this interference contour. The applicant would like to note the existence of the dedicated transmitter building located at the base of the tower. However, structures of this nature have been exempt as a matter of FCC Policy.

Exhibit 8
§74.1204(d) 2nd/3rd Adjacent Channel Given Interference Waiver Request with WTHK(FM) - Wilmington, VT (CH264A)

Site Coordinates (NGS NADCON)

	Latitude	Longitude
NAD 27 values:	42 53 46.00735	72 39 47.66699
NAD 83 values:	42 53 46.30000	72 39 46.00000

° W262CL.P

103.04 dBµ F(50:10) Interference Contour

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Google Earth Pro™
Account #4375669785
Used with Permission

N

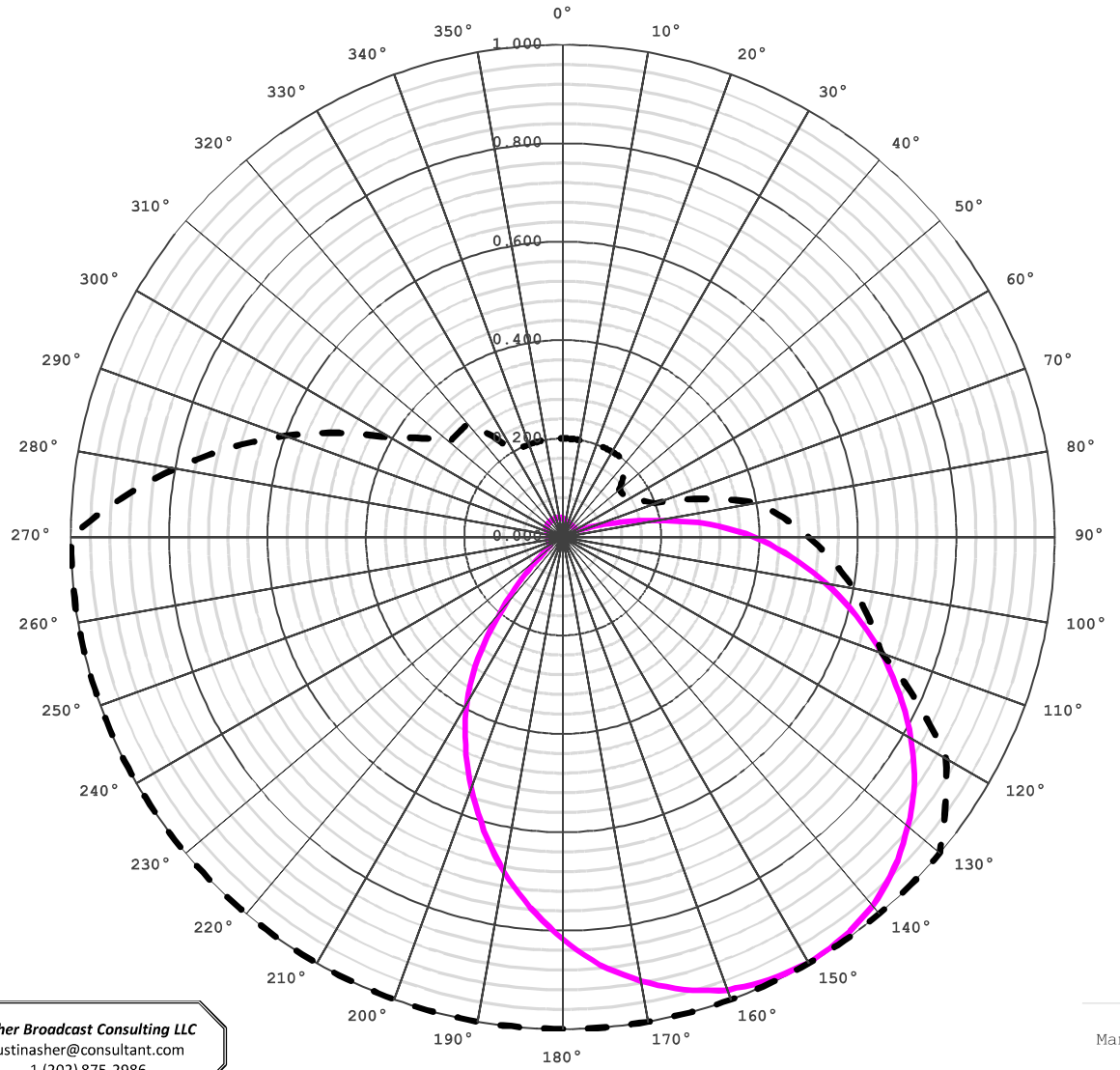
2000 ft

Google Earth

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

Manufacturer's	Make/Model	Orientation	Power
Element 1:	CI-FM(Slant45)	150° True	100.0%
Element 2:			
Element 3:			
Element 4:			

Composite Power: 100%



Azimuth ° True	FCC Pattern	Manufacturer's Pattern
0°	0.200	0.038
10°	0.200	0.034
20°	0.200	0.030
30°	0.200	0.030
40°	0.200	0.030
50°	0.150	0.030
60°	0.150	0.030
70°	0.200	0.050
80°	0.400	0.190
90°	0.500	0.390
100°	0.600	0.544
110°	0.690	0.690
120°	0.900	0.817
130°	1.000	0.916
140°	1.000	0.980
150°	1.000	1.000
160°	1.000	0.980
170°	1.000	0.916
180°	1.000	0.817
190°	1.000	0.690
200°	1.000	0.544
210°	1.000	0.390
220°	1.000	0.190
230°	1.000	0.050
240°	1.000	0.030
250°	1.000	0.030
260°	1.000	0.030
270°	1.000	0.030
280°	0.800	0.030
290°	0.600	0.034
300°	0.400	0.038
310°	0.300	0.040
320°	0.300	0.040
330°	0.200	0.040
340°	0.200	0.040
350°	0.200	0.040

FCC Pattern: – – –
Manufacturer's Pattern: ——

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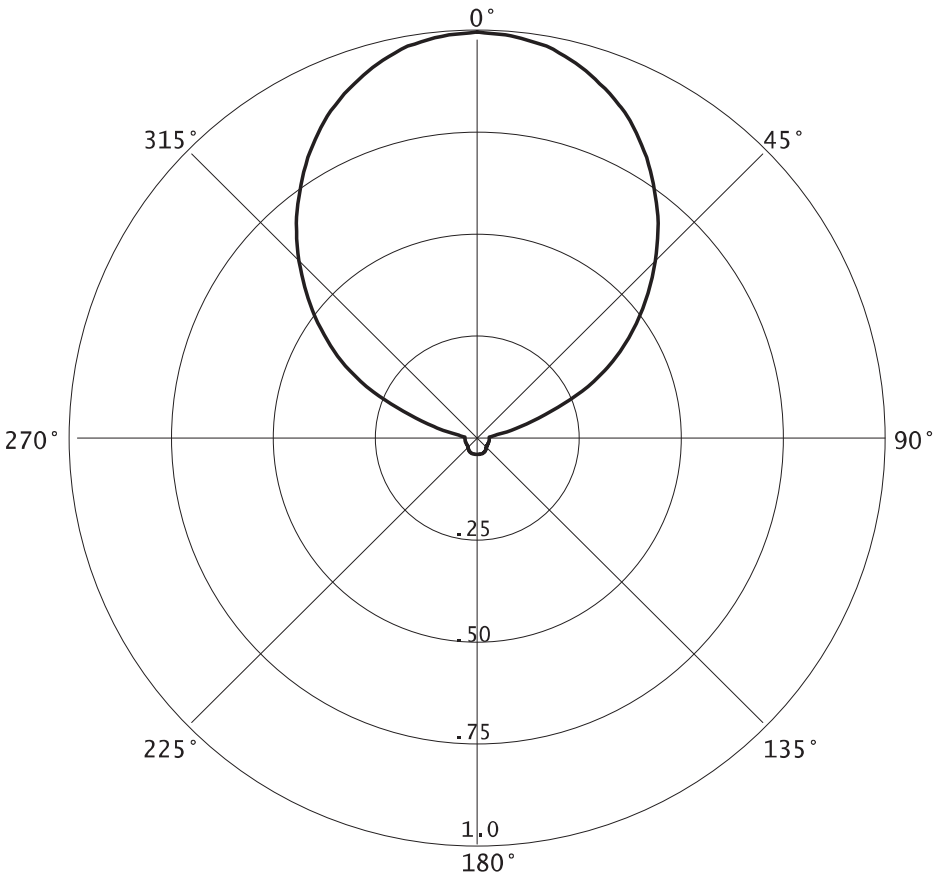
Exhibit 9
Copy of Manufacturer's Directional Antenna Documentation
(Actual Antenna Pattern rotated to 150.0°T) *(public record copy)*

CL-FM(Slant-45)
COMPOSITE PATTERN

RMS(V)= .468

Graph is Relative Field



Azi	Field	dBk
000	1.000	00.000
010	0.980	-00.175
020	0.916	-00.762
030	0.817	-01.756
040	0.690	-03.223
050	0.544	-05.288
060	0.390	-08.179
070	0.190	-14.425
080	0.050	-26.021
090	0.030	-30.458
100	0.030	-30.458
110	0.030	-30.458
120	0.030	-30.458
130	0.030	-30.458
140	0.034	-29.370
150	0.038	-28.404
160	0.040	-27.959
170	0.040	-27.959
180	0.040	-27.959
190	0.040	-27.959
200	0.040	-27.959
210	0.038	-28.404
220	0.034	-29.370
230	0.030	-30.458
240	0.030	-30.458
250	0.030	-30.458
260	0.030	-30.458
270	0.030	-30.458
280	0.050	-26.021
290	0.190	-14.425
300	0.390	-08.179
310	0.544	-05.288
320	0.690	-03.223
330	0.817	-01.756
340	0.916	-00.762
350	0.980	-00.175

The directional antenna pattern will be produced by means of a Scala Log Periodic CL-FM broadcast element mounted at a 45° (degree) slant orientation to achieve horizontal and vertical polarization. The CL-FM(Slant-45) Directional Pattern is therefore a maximum composite pattern of the current CL-FM(Horizontal) and CL-FM(Vertical) broadcast patterns as notified by the Scala Division (Kathrein-Scala) of Kathrein, Inc.

The maximum antenna gain for a single CL-FM(Slant-45) element will be 4.0 dBd or the common Horizontal or Vertical maximum antenna gain of 7.0 dBd adjusted by 3 dBd for dual broadcast in the Horizontal and Vertical planes (4.0 dBd = 7.0 dBd - 3.0 dBd). The maximum gain for multiple bay options of the Scala CL-FM(Slant-45) antenna would therefore also be adjusted by -3 dBd to account for operation in the Horizontal and Vertical planes.

The antenna proposed in this application will be mounted in accordance with specific instructions provided by the antenna manufacturer. The directional antenna will be mounted on the tower which is of uniform cross section. No other antennas of any type are or will be mounted on the same tower level as the directional antenna.

No antenna is or will be mounted within any vertical or horizontal distance specified by the antenna manufacturer as being necessary for proper operation of the directional antenna. In addition, the antenna will be assembled under the supervision of a qualified engineer and installed pursuant to the manufacturer's instructions and manufacturer specified antenna orientation.

Exhibit 9
Copy of Manufacturer's Directional Antenna Documentation
(Actual Antenna Pattern rotated to 150.0°T) *(public record copy)*

KATHREIN
SCALA DIVISION

CL-FM
FM LOG-PERIODIC ANTENNA
7 dBd gain
88–108 MHz

The Kathrein Scala Division CL-FM is a ruggedly built log-periodic antenna, designed for professional FM transmit and receive applications.

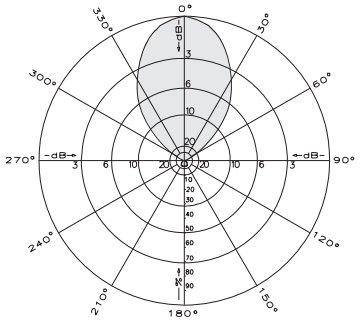
Like all Kathrein Scala Division antennas, the CL-FM is made of the finest materials using state of the art electrical and mechanical designs, resulting in superior performance and long service life.

The CL-FM may be used stand-alone or in stacked arrays for higher gain, increased side-lobe suppression, or custom azimuth patterns.

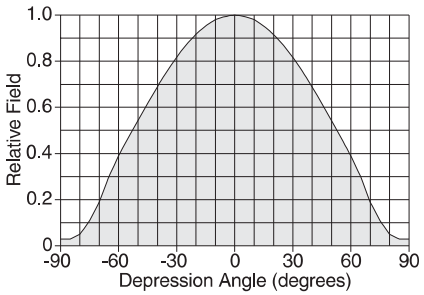
Specifications:

Frequency range	88–108 MHz (broadband)
Gain	7 dBd
Impedance	50 or 75 ohms
VSWR	< 1.5:1
Polarization	Horizontal or vertical
Front-to-back ratio	>25 dB
Maximum input power	250 watts, type "N" 75 ohm connector 500 watts, type "N" 50 ohm connector
Azimuth pattern	52 degrees (half-power) horizontal polarization
Elevation pattern	78 degrees (half-power) horizontal polarization
Connector	Female 50Ω or 75Ω N
Weight	45 lb (20.4 kg)
Dimensions	104 x 67.9 inches (2642 x 1724 mm)
Equivalent flat plate area	
CL-FM/HCM	5.31 ft² (0.494 m²)
CL-FM/HRM	5.86 ft² (0.544 m²)
CL-FM/VRM	5.86 ft² (0.544 m²)
Wind survival rating*	120 mph (200 kph)
Shipping dimensions	116 x 14.5 x 6 inches (2946 x 369 x 153 mm)
Shipping weight	56 lb (25.4 kg)
Mounting	For masts of 2.375 inches (60 mm) OD.
CL-FM/HCM	Horizontal polarization center-mount
CL-FM/HRM	Horizontal polarization rear-mount
CL-FM/VRM	Vertical polarization rear-mount

See reverse for order information.



Azimuth pattern (E-plane)



Elevation pattern (H-plane)

* Mechanical design is based on environmental conditions as stipulated in EIA-222-F (June 1996) and/or ETS 300 019-1-4 which include the static mechanical load imposed on an antenna by wind at maximum velocity. See the Engineering Section of the catalog for further details.

10492-D

Kathrein Inc., Scala Division Post Office Box 4580 Medford, OR 97501 (USA) Phone: (541) 779-6500 Fax: (541) 779-6575
Email: broadcast@kathrein.com Internet: www.kathrein-scala.com

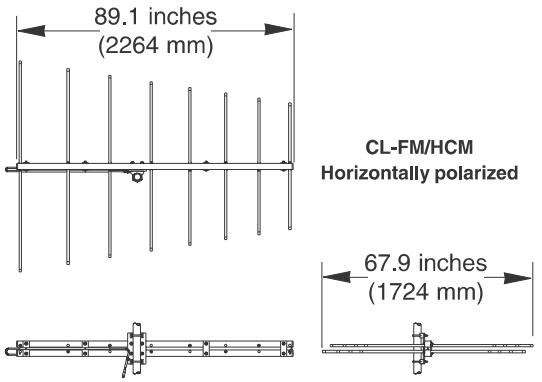
Exhibit 9
Copy of Manufacturer's Directional Antenna Documentation
(Actual Antenna Pattern rotated to 150.0°T) ***(public record copy)***

CL-FM

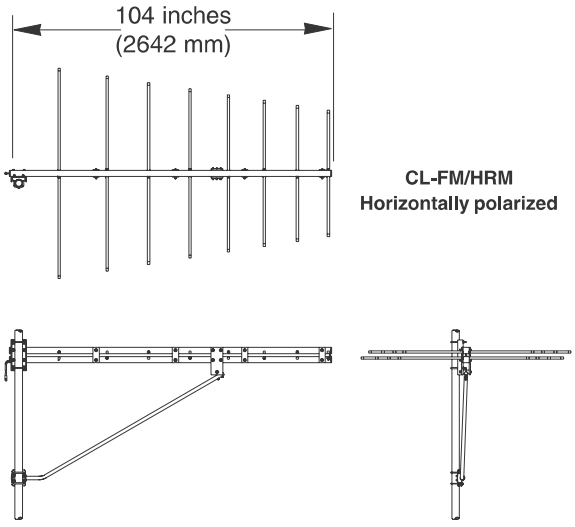
FM LOG-PERIODIC ANTENNA

7 dBd gain

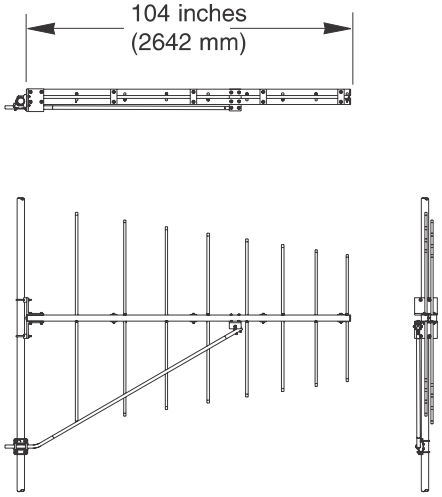
88–108 MHz



CL-FM/HCM
Horizontally polarized



CL-FM/HRM
Horizontally polarized



CL-FM/VRM
Vertically polarized

Vertically polarized antennas require lateral stabilization (not supplied) to prevent the antenna from turning on the mounting pipe.

Order Information:

Model	Description
CL-FM/HCM/50N	Antenna with 50Ω N connector Horizontal polarization center-mount
CL-FM/HCM/75N	Antenna with 75Ω N connector Horizontal polarization center-mount
CL-FM/HRM/50N	Antenna with 50Ω N connector Horizontal polarization rear-mount

Order Information:

Model	Description
CL-FM/HRM/75N	Antenna with 75Ω N connector Horizontal polarization rear-mount
CL-FM/VRM/50N	Antenna with 50Ω N connector Vertical polarization rear-mount
CL-FM/VRM/75N	Antenna with 75Ω N connector Vertical polarization rear-mount

All specifications are subject to change without notice

Kathrein Inc., Scala Division Post Office Box 4580 Medford, OR 97501 (USA) Phone: (541) 779-6500 Fax: (541) 779-6575
Email: broadcast@kathrein.com Internet: www.kathrein-scala.com

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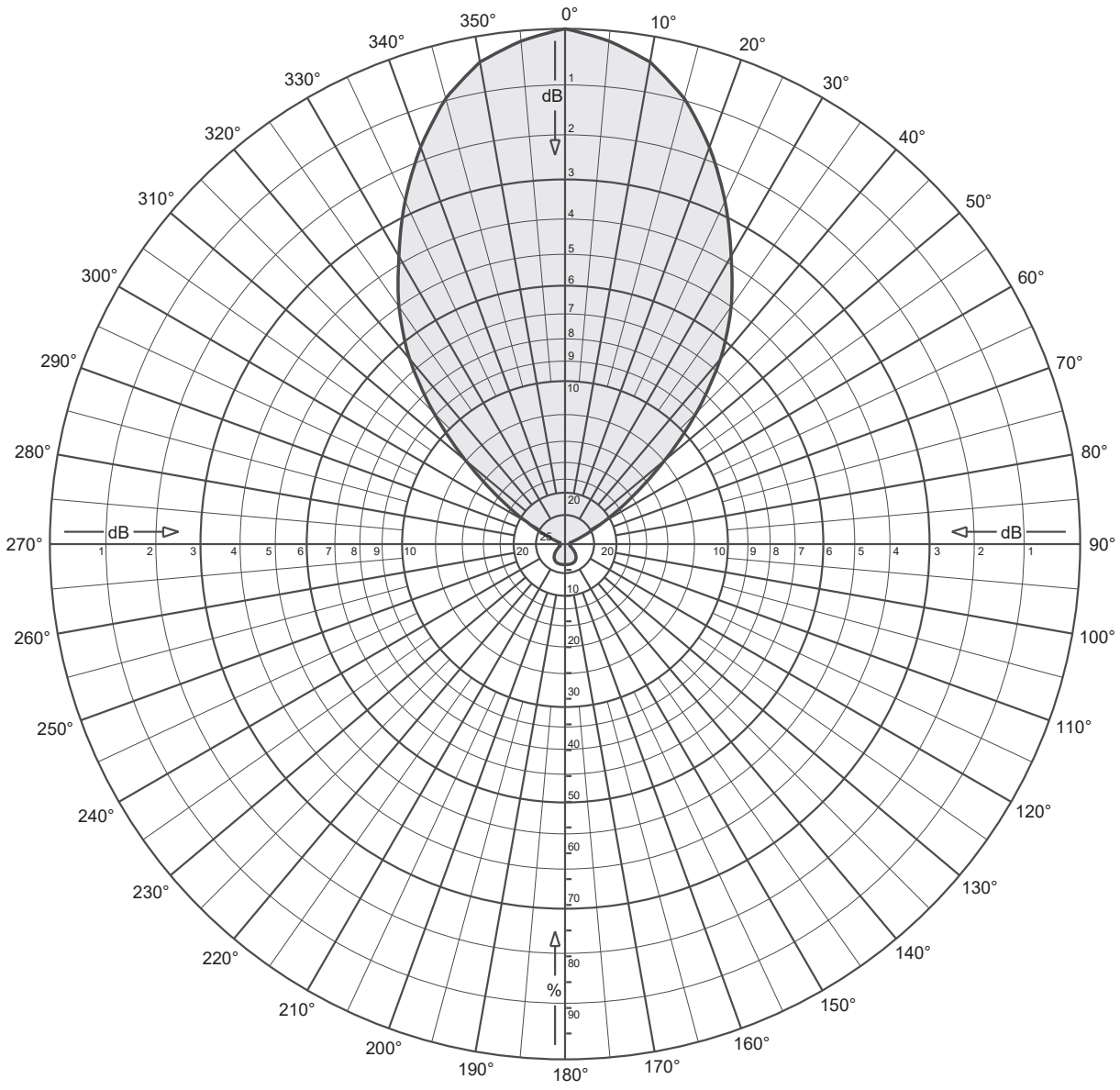

CL-FM
FM
Maximum gain: 7.0 dBd
Horizontal polarization Component
Horizontal radiation pattern
0 degree electrical downtilt

KATHREIN
SCALA DIVISION
Post Office Box 4580
Medford, OR 97501 (USA)
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Fax:(541)779-3991
http://www.kathrein-scala.com

26-Oct-2011

Exhibit 9
Copy of Manufacturer's Directional Antenna Documentation
(Actual Antenna Pattern rotated to 150.0°T) *(public record copy)*

KATHREIN
SCALA DIVISION

CL-FM
FM
Maximum gain: 7.0 dBd
Horizontal polarization Component

Horizontal radiation pattern
0 degree electrical downtilt

Angle	Field	Rel.dB	dBd	PwrMult	Angle	Field	Rel.dB	dBd	PwrMult
0	1.000	0.00	7.00	5.01	45	0.360	-8.87	-1.87	0.65
1	0.996	-0.03	6.97	4.97	46	0.338	-9.42	-2.42	0.57
2	0.992	-0.07	6.93	4.93	47	0.316	-10.01	-3.01	0.50
3	0.988	-0.10	6.90	4.89	48	0.294	-10.63	-3.63	0.43
4	0.984	-0.14	6.86	4.85	49	0.272	-11.31	-4.31	0.37
5	0.980	-0.18	6.82	4.81	50	0.250	-12.04	-5.04	0.31
6	0.974	-0.23	6.77	4.75	51	0.231	-12.73	-5.73	0.27
7	0.968	-0.28	6.72	4.70	52	0.212	-13.47	-6.47	0.23
8	0.962	-0.34	6.66	4.64	53	0.193	-14.29	-7.29	0.19
9	0.956	-0.39	6.61	4.58	54	0.174	-15.19	-8.19	0.15
10	0.950	-0.45	6.55	4.52	55	0.155	-16.19	-9.19	0.12
11	0.939	-0.55	6.45	4.42	56	0.141	-17.02	-10.02	0.10
12	0.928	-0.65	6.35	4.32	57	0.127	-17.92	-10.92	0.08
13	0.917	-0.75	6.25	4.21	58	0.113	-18.94	-11.94	0.06
14	0.906	-0.86	6.14	4.11	59	0.099	-20.09	-13.09	0.05
15	0.895	-0.96	6.04	4.01	60	0.085	-21.41	-14.41	0.04
16	0.880	-1.11	5.89	3.88	61	0.077	-22.27	-15.27	0.03
17	0.865	-1.26	5.74	3.75	62	0.069	-23.22	-16.22	0.02
18	0.850	-1.41	5.59	3.62	63	0.061	-24.29	-17.29	0.02
19	0.835	-1.57	5.43	3.49	64	0.053	-25.51	-18.51	0.01
20	0.820	-1.72	5.28	3.37	65	0.045	-26.94	-19.94	0.01
21	0.803	-1.91	5.09	3.23	66	0.040	-27.96	-20.96	0.01
22	0.786	-2.09	4.91	3.10	67	0.035	-29.12	-22.12	0.01
23	0.769	-2.28	4.72	2.96	68	0.030	-30.46	-23.46	0.00
24	0.752	-2.48	4.52	2.83	69	0.025	-32.04	-25.04	0.00
25	0.735	-2.67	4.33	2.71	70	0.020	-33.98	-26.98	0.00
26	0.717	-2.89	4.11	2.58	71	0.018	-34.89	-27.89	0.00
27	0.699	-3.11	3.89	2.45	72	0.016	-35.92	-28.92	0.00
28	0.681	-3.34	3.66	2.32	73	0.014	-37.08	-30.08	0.00
29	0.663	-3.57	3.43	2.20	74	0.012	-38.42	-31.42	0.00
30	0.645	-3.81	3.19	2.09	75	0.010	-40.00	-33.00	0.00
31	0.628	-4.03	2.97	1.98	76	0.010	-40.00	-33.00	0.00
32	0.612	-4.26	2.74	1.88	77	0.010	-40.00	-33.00	0.00
33	0.595	-4.50	2.50	1.78	78	0.010	-40.00	-33.00	0.00
34	0.579	-4.75	2.25	1.68	79	0.010	-40.00	-33.00	0.00
35	0.562	-5.00	2.00	1.59	80	0.010	-40.00	-33.00	0.00
36	0.544	-5.29	1.71	1.48	81	0.010	-40.00	-33.00	0.00
37	0.525	-5.59	1.41	1.38	82	0.010	-40.00	-33.00	0.00
38	0.507	-5.90	1.10	1.29	83	0.010	-40.00	-33.00	0.00
39	0.488	-6.22	0.78	1.20	84	0.010	-40.00	-33.00	0.00
40	0.470	-6.56	0.44	1.11	85	0.010	-40.00	-33.00	0.00
41	0.448	-6.97	0.03	1.01	86	0.010	-40.00	-33.00	0.00
42	0.426	-7.41	-0.41	0.91	87	0.010	-40.00	-33.00	0.00
43	0.404	-7.87	-0.87	0.82	88	0.010	-40.00	-33.00	0.00
44	0.382	-8.36	-1.36	0.73	89	0.010	-40.00	-33.00	0.00

Exhibit 9
Copy of Manufacturer's Directional Antenna Documentation
(Actual Antenna Pattern rotated to 150.0°T) *(public record copy)*

KATHREIN
SCALA DIVISION

CL-FM
FM
Maximum gain: 7.0 dBd
Horizontal polarization Component

Horizontal radiation pattern
0 degree electrical downtilt

Angle	Field	Rel.dB	dBd	PwrMult	Angle	Field	Rel.dB	dBd	PwrMult
90	0.010	-40.00	-33.00	0.00	135	0.029	-30.75	-23.75	0.00
91	0.010	-40.00	-33.00	0.00	136	0.030	-30.49	-23.49	0.00
92	0.010	-40.00	-33.00	0.00	137	0.031	-30.23	-23.23	0.00
93	0.010	-40.00	-33.00	0.00	138	0.032	-29.98	-22.98	0.01
94	0.010	-40.00	-33.00	0.00	139	0.033	-29.74	-22.74	0.01
95	0.010	-40.00	-33.00	0.00	140	0.034	-29.50	-22.50	0.01
96	0.010	-40.00	-33.00	0.00	141	0.034	-29.37	-22.37	0.01
97	0.010	-40.00	-33.00	0.00	142	0.034	-29.24	-22.24	0.01
98	0.010	-40.00	-33.00	0.00	143	0.035	-29.12	-22.12	0.01
99	0.010	-40.00	-33.00	0.00	144	0.036	-29.00	-22.00	0.01
100	0.010	-40.00	-33.00	0.00	145	0.036	-28.87	-21.87	0.01
101	0.010	-40.00	-33.00	0.00	146	0.036	-28.75	-21.75	0.01
102	0.010	-40.00	-33.00	0.00	147	0.037	-28.64	-21.64	0.01
103	0.010	-40.00	-33.00	0.00	148	0.038	-28.52	-21.52	0.01
104	0.010	-40.00	-33.00	0.00	149	0.038	-28.40	-21.40	0.01
105	0.010	-40.00	-33.00	0.00	150	0.038	-28.29	-21.29	0.01
106	0.010	-40.00	-33.00	0.00	151	0.039	-28.25	-21.25	0.01
107	0.010	-40.00	-33.00	0.00	152	0.039	-28.20	-21.20	0.01
108	0.010	-40.00	-33.00	0.00	153	0.039	-28.16	-21.16	0.01
109	0.010	-40.00	-33.00	0.00	154	0.039	-28.11	-21.11	0.01
110	0.010	-40.00	-33.00	0.00	155	0.039	-28.07	-21.07	0.01
111	0.010	-39.58	-32.58	0.00	156	0.040	-28.05	-21.05	0.01
112	0.011	-39.17	-32.17	0.00	157	0.040	-28.02	-21.02	0.01
113	0.012	-38.79	-31.79	0.00	158	0.040	-28.00	-21.00	0.01
114	0.012	-38.42	-31.42	0.00	159	0.040	-27.98	-20.98	0.01
115	0.012	-38.06	-31.06	0.00	160	0.040	-27.96	-20.96	0.01
116	0.013	-37.72	-30.72	0.00	161	0.040	-27.96	-20.96	0.01
117	0.013	-37.39	-30.39	0.00	162	0.040	-27.96	-20.96	0.01
118	0.014	-37.08	-30.08	0.00	163	0.040	-27.96	-20.96	0.01
119	0.014	-36.77	-29.77	0.00	164	0.040	-27.96	-20.96	0.01
120	0.015	-36.48	-29.48	0.00	165	0.040	-27.96	-20.96	0.01
121	0.016	-35.92	-28.92	0.00	166	0.040	-27.96	-20.96	0.01
122	0.017	-35.39	-28.39	0.00	167	0.040	-27.96	-20.96	0.01
123	0.018	-34.89	-27.89	0.00	168	0.040	-27.96	-20.96	0.01
124	0.019	-34.42	-27.42	0.00	169	0.040	-27.96	-20.96	0.01
125	0.020	-33.98	-26.98	0.00	170	0.040	-27.96	-20.96	0.01
126	0.021	-33.56	-26.56	0.00	171	0.040	-27.96	-20.96	0.01
127	0.022	-33.15	-26.15	0.00	172	0.040	-27.96	-20.96	0.01
128	0.023	-32.77	-25.77	0.00	173	0.040	-27.96	-20.96	0.01
129	0.024	-32.40	-25.40	0.00	174	0.040	-27.96	-20.96	0.01
130	0.025	-32.04	-25.04	0.00	175	0.040	-27.96	-20.96	0.01
131	0.026	-31.77	-24.77	0.00	176	0.040	-27.96	-20.96	0.01
132	0.027	-31.50	-24.50	0.00	177	0.040	-27.96	-20.96	0.01
133	0.027	-31.24	-24.24	0.00	178	0.040	-27.96	-20.96	0.01
134	0.028	-31.00	-24.00	0.00	179	0.040	-27.96	-20.96	0.01

Exhibit 9
Copy of Manufacturer's Directional Antenna Documentation
(Actual Antenna Pattern rotated to 150.0°T) *(public record copy)*

KATHREIN
SCALA DIVISION

CL-FM
FM
Maximum gain: 7.0 dBd
Horizontal polarization Component

Horizontal radiation pattern
0 degree electrical downtilt

Angle	Field	Rel.dB	dBd	PwrMult	Angle	Field	Rel.dB	dBd	PwrMult
180	0.040	-27.96	-20.96	0.01	225	0.029	-30.75	-23.75	0.00
181	0.040	-27.96	-20.96	0.01	226	0.028	-31.00	-24.00	0.00
182	0.040	-27.96	-20.96	0.01	227	0.027	-31.24	-24.24	0.00
183	0.040	-27.96	-20.96	0.01	228	0.027	-31.50	-24.50	0.00
184	0.040	-27.96	-20.96	0.01	229	0.026	-31.77	-24.77	0.00
185	0.040	-27.96	-20.96	0.01	230	0.025	-32.04	-25.04	0.00
186	0.040	-27.96	-20.96	0.01	231	0.024	-32.40	-25.40	0.00
187	0.040	-27.96	-20.96	0.01	232	0.023	-32.77	-25.77	0.00
188	0.040	-27.96	-20.96	0.01	233	0.022	-33.15	-26.15	0.00
189	0.040	-27.96	-20.96	0.01	234	0.021	-33.56	-26.56	0.00
190	0.040	-27.96	-20.96	0.01	235	0.020	-33.98	-26.98	0.00
191	0.040	-27.96	-20.96	0.01	236	0.019	-34.42	-27.42	0.00
192	0.040	-27.96	-20.96	0.01	237	0.018	-34.89	-27.89	0.00
193	0.040	-27.96	-20.96	0.01	238	0.017	-35.39	-28.39	0.00
194	0.040	-27.96	-20.96	0.01	239	0.016	-35.92	-28.92	0.00
195	0.040	-27.96	-20.96	0.01	240	0.015	-36.48	-29.48	0.00
196	0.040	-27.96	-20.96	0.01	241	0.014	-36.77	-29.77	0.00
197	0.040	-27.96	-20.96	0.01	242	0.014	-37.08	-30.08	0.00
198	0.040	-27.96	-20.96	0.01	243	0.013	-37.39	-30.39	0.00
199	0.040	-27.96	-20.96	0.01	244	0.013	-37.72	-30.72	0.00
200	0.040	-27.96	-20.96	0.01	245	0.012	-38.06	-31.06	0.00
201	0.040	-27.98	-20.98	0.01	246	0.012	-38.42	-31.42	0.00
202	0.040	-28.00	-21.00	0.01	247	0.012	-38.79	-31.79	0.00
203	0.040	-28.02	-21.02	0.01	248	0.011	-39.17	-32.17	0.00
204	0.040	-28.05	-21.05	0.01	249	0.010	-39.58	-32.58	0.00
205	0.039	-28.07	-21.07	0.01	250	0.010	-40.00	-33.00	0.00
206	0.039	-28.11	-21.11	0.01	251	0.010	-40.00	-33.00	0.00
207	0.039	-28.16	-21.16	0.01	252	0.010	-40.00	-33.00	0.00
208	0.039	-28.20	-21.20	0.01	253	0.010	-40.00	-33.00	0.00
209	0.039	-28.25	-21.25	0.01	254	0.010	-40.00	-33.00	0.00
210	0.038	-28.29	-21.29	0.01	255	0.010	-40.00	-33.00	0.00
211	0.038	-28.40	-21.40	0.01	256	0.010	-40.00	-33.00	0.00
212	0.038	-28.52	-21.52	0.01	257	0.010	-40.00	-33.00	0.00
213	0.037	-28.64	-21.64	0.01	258	0.010	-40.00	-33.00	0.00
214	0.036	-28.75	-21.75	0.01	259	0.010	-40.00	-33.00	0.00
215	0.036	-28.87	-21.87	0.01	260	0.010	-40.00	-33.00	0.00
216	0.036	-29.00	-22.00	0.01	261	0.010	-40.00	-33.00	0.00
217	0.035	-29.12	-22.12	0.01	262	0.010	-40.00	-33.00	0.00
218	0.034	-29.24	-22.24	0.01	263	0.010	-40.00	-33.00	0.00
219	0.034	-29.37	-22.37	0.01	264	0.010	-40.00	-33.00	0.00
220	0.034	-29.50	-22.50	0.01	265	0.010	-40.00	-33.00	0.00
221	0.033	-29.74	-22.74	0.01	266	0.010	-40.00	-33.00	0.00
222	0.032	-29.98	-22.98	0.01	267	0.010	-40.00	-33.00	0.00
223	0.031	-30.23	-23.23	0.00	268	0.010	-40.00	-33.00	0.00
224	0.030	-30.49	-23.49	0.00	269	0.010	-40.00	-33.00	0.00

Exhibit 9
Copy of Manufacturer's Directional Antenna Documentation
(Actual Antenna Pattern rotated to 150.0°T) *(public record copy)*

KATHREIN
SCALA DIVISION

CL-FM
FM
Maximum gain: 7.0 dBd
Horizontal polarization Component

Horizontal radiation pattern
0 degree electrical downtilt

Angle	Field	Rel.dB	dBd	PwrMult	Angle	Field	Rel.dB	dBd	PwrMult
270	0.010	-40.00	-33.00	0.00	315	0.360	-8.87	-1.87	0.65
271	0.010	-40.00	-33.00	0.00	316	0.382	-8.36	-1.36	0.73
272	0.010	-40.00	-33.00	0.00	317	0.404	-7.87	-0.87	0.82
273	0.010	-40.00	-33.00	0.00	318	0.426	-7.41	-0.41	0.91
274	0.010	-40.00	-33.00	0.00	319	0.448	-6.97	0.03	1.01
275	0.010	-40.00	-33.00	0.00	320	0.470	-6.56	0.44	1.11
276	0.010	-40.00	-33.00	0.00	321	0.488	-6.22	0.78	1.20
277	0.010	-40.00	-33.00	0.00	322	0.507	-5.90	1.10	1.29
278	0.010	-40.00	-33.00	0.00	323	0.525	-5.59	1.41	1.38
279	0.010	-40.00	-33.00	0.00	324	0.544	-5.29	1.71	1.48
280	0.010	-40.00	-33.00	0.00	325	0.562	-5.00	2.00	1.59
281	0.010	-40.00	-33.00	0.00	326	0.579	-4.75	2.25	1.68
282	0.010	-40.00	-33.00	0.00	327	0.595	-4.50	2.50	1.78
283	0.010	-40.00	-33.00	0.00	328	0.612	-4.26	2.74	1.88
284	0.010	-40.00	-33.00	0.00	329	0.628	-4.03	2.97	1.98
285	0.010	-40.00	-33.00	0.00	330	0.645	-3.81	3.19	2.09
286	0.012	-38.42	-31.42	0.00	331	0.663	-3.57	3.43	2.20
287	0.014	-37.08	-30.08	0.00	332	0.681	-3.34	3.66	2.32
288	0.016	-35.92	-28.92	0.00	333	0.699	-3.11	3.89	2.45
289	0.018	-34.89	-27.89	0.00	334	0.717	-2.89	4.11	2.58
290	0.020	-33.98	-26.98	0.00	335	0.735	-2.67	4.33	2.71
291	0.025	-32.04	-25.04	0.00	336	0.752	-2.48	4.52	2.83
292	0.030	-30.46	-23.46	0.00	337	0.769	-2.28	4.72	2.96
293	0.035	-29.12	-22.12	0.01	338	0.786	-2.09	4.91	3.10
294	0.040	-27.96	-20.96	0.01	339	0.803	-1.91	5.09	3.23
295	0.045	-26.94	-19.94	0.01	340	0.820	-1.72	5.28	3.37
296	0.053	-25.51	-18.51	0.01	341	0.835	-1.57	5.43	3.49
297	0.061	-24.29	-17.29	0.02	342	0.850	-1.41	5.59	3.62
298	0.069	-23.22	-16.22	0.02	343	0.865	-1.26	5.74	3.75
299	0.077	-22.27	-15.27	0.03	344	0.880	-1.11	5.89	3.88
300	0.085	-21.41	-14.41	0.04	345	0.895	-0.96	6.04	4.01
301	0.099	-20.09	-13.09	0.05	346	0.906	-0.86	6.14	4.11
302	0.113	-18.94	-11.94	0.06	347	0.917	-0.75	6.25	4.21
303	0.127	-17.92	-10.92	0.08	348	0.928	-0.65	6.35	4.32
304	0.141	-17.02	-10.02	0.10	349	0.939	-0.55	6.45	4.42
305	0.155	-16.19	-9.19	0.12	350	0.950	-0.45	6.55	4.52
306	0.174	-15.19	-8.19	0.15	351	0.956	-0.39	6.61	4.58
307	0.193	-14.29	-7.29	0.19	352	0.962	-0.34	6.66	4.64
308	0.212	-13.47	-6.47	0.23	353	0.968	-0.28	6.72	4.70
309	0.231	-12.73	-5.73	0.27	354	0.974	-0.23	6.77	4.75
310	0.250	-12.04	-5.04	0.31	355	0.980	-0.18	6.82	4.81
311	0.272	-11.31	-4.31	0.37	356	0.984	-0.14	6.86	4.85
312	0.294	-10.63	-3.63	0.43	357	0.988	-0.10	6.90	4.89
313	0.316	-10.01	-3.01	0.50	358	0.992	-0.07	6.93	4.93
314	0.338	-9.42	-2.42	0.57	359	0.996	-0.03	6.97	4.97

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Copy of Manufacturer's Directional Antenna Documentation
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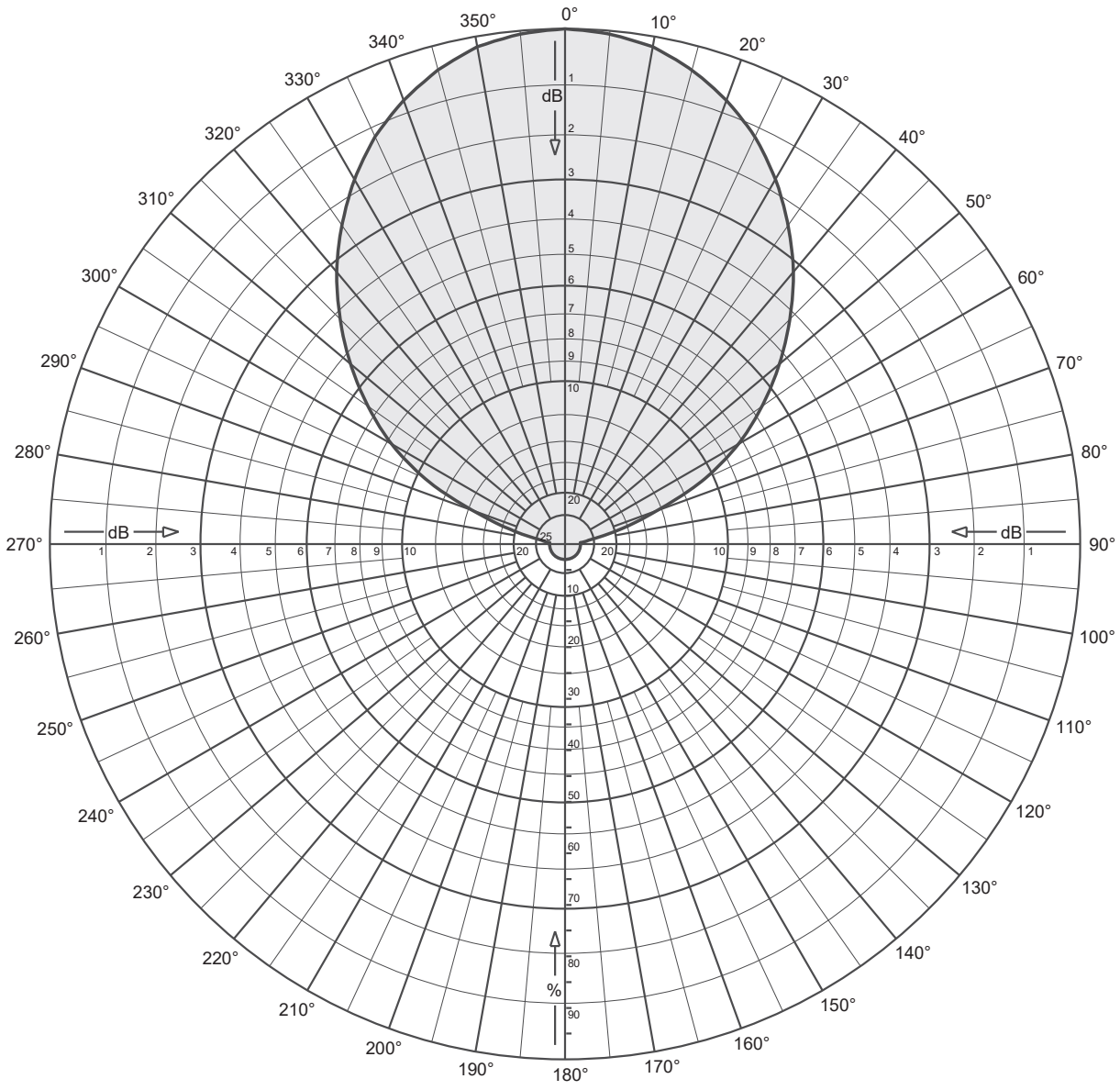

CL-FM
FM
Maximum gain: 7.0 dBd
Vertical polarization Component
Horizontal radiation pattern
0 degree electrical downtilt

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26-Oct-2011

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KATHREIN
SCALA DIVISION

CL-FM
FM
Maximum gain: 7.0 dBd
Vertical polarization Component

Horizontal radiation pattern
0 degree electrical downtilt

Angle	Field	Rel.dB	dBd	PwrMult	Angle	Field	Rel.dB	dBd	PwrMult
0	1.000	0.00	7.00	5.01	45	0.618	-4.19	2.81	1.91
1	0.998	-0.01	6.99	5.00	46	0.602	-4.40	2.60	1.82
2	0.997	-0.02	6.98	4.99	47	0.588	-4.61	2.39	1.73
3	0.996	-0.03	6.97	4.97	48	0.573	-4.84	2.16	1.65
4	0.995	-0.04	6.96	4.96	49	0.558	-5.06	1.94	1.56
5	0.993	-0.06	6.94	4.95	50	0.544	-5.30	1.70	1.48
6	0.991	-0.08	6.92	4.92	51	0.528	-5.54	1.46	1.40
7	0.988	-0.10	6.90	4.89	52	0.513	-5.80	1.20	1.32
8	0.985	-0.13	6.87	4.87	53	0.498	-6.06	0.94	1.24
9	0.982	-0.15	6.85	4.84	54	0.483	-6.33	0.67	1.17
10	0.980	-0.18	6.82	4.81	55	0.467	-6.60	0.40	1.10
11	0.975	-0.22	6.78	4.76	56	0.452	-6.90	0.10	1.02
12	0.969	-0.27	6.73	4.71	57	0.436	-7.20	-0.20	0.95
13	0.964	-0.32	6.68	4.65	58	0.421	-7.51	-0.51	0.89
14	0.958	-0.37	6.63	4.60	59	0.405	-7.84	-0.84	0.82
15	0.952	-0.42	6.58	4.55	60	0.390	-8.18	-1.18	0.76
16	0.946	-0.49	6.51	4.48	61	0.372	-8.59	-1.59	0.69
17	0.938	-0.56	6.44	4.41	62	0.354	-9.02	-2.02	0.63
18	0.931	-0.62	6.38	4.34	63	0.336	-9.47	-2.47	0.57
19	0.923	-0.69	6.31	4.27	64	0.318	-9.95	-2.95	0.51
20	0.916	-0.76	6.24	4.21	65	0.300	-10.46	-3.46	0.45
21	0.908	-0.84	6.16	4.13	66	0.278	-11.12	-4.12	0.39
22	0.899	-0.92	6.08	4.05	67	0.256	-11.84	-4.84	0.33
23	0.890	-1.01	5.99	3.97	68	0.234	-12.62	-5.62	0.27
24	0.882	-1.10	5.90	3.89	69	0.212	-13.47	-6.47	0.23
25	0.873	-1.18	5.82	3.82	70	0.190	-14.42	-7.42	0.18
26	0.862	-1.29	5.71	3.72	71	0.174	-15.19	-8.19	0.15
27	0.851	-1.41	5.59	3.63	72	0.158	-16.03	-9.03	0.13
28	0.840	-1.52	5.48	3.53	73	0.142	-16.95	-9.95	0.10
29	0.829	-1.63	5.37	3.44	74	0.126	-17.99	-10.99	0.08
30	0.817	-1.75	5.25	3.35	75	0.110	-19.17	-12.17	0.06
31	0.806	-1.88	5.12	3.25	76	0.098	-20.18	-13.18	0.05
32	0.793	-2.02	4.98	3.15	77	0.086	-21.31	-14.31	0.04
33	0.781	-2.15	4.85	3.05	78	0.074	-22.62	-15.62	0.03
34	0.767	-2.30	4.70	2.95	79	0.062	-24.15	-17.15	0.02
35	0.756	-2.44	4.56	2.86	80	0.050	-26.02	-19.02	0.01
36	0.742	-2.59	4.41	2.76	81	0.046	-26.74	-19.74	0.01
37	0.729	-2.74	4.26	2.67	82	0.042	-27.54	-20.54	0.01
38	0.716	-2.90	4.10	2.57	83	0.038	-28.40	-21.40	0.01
39	0.704	-3.05	3.95	2.48	84	0.034	-29.37	-22.37	0.01
40	0.690	-3.22	3.78	2.39	85	0.030	-30.46	-23.46	0.00
41	0.675	-3.41	3.59	2.29	86	0.030	-30.46	-23.46	0.00
42	0.661	-3.60	3.40	2.19	87	0.030	-30.46	-23.46	0.00
43	0.646	-3.79	3.21	2.09	88	0.030	-30.46	-23.46	0.00
44	0.632	-3.99	3.01	2.00	89	0.030	-30.46	-23.46	0.00

Exhibit 9
Copy of Manufacturer's Directional Antenna Documentation
(Actual Antenna Pattern rotated to 150.0°T) *(public record copy)*

KATHREIN
SCALA DIVISION

CL-FM
FM
Maximum gain: 7.0 dBd
Vertical polarization Component

Horizontal radiation pattern
0 degree electrical downtilt

Angle	Field	Rel.dB	dBd	PwrMult	Angle	Field	Rel.dB	dBd	PwrMult
90	0.030	-30.46	-23.46	0.00	135	0.030	-30.46	-23.46	0.00
91	0.030	-30.46	-23.46	0.00	136	0.030	-30.46	-23.46	0.00
92	0.030	-30.46	-23.46	0.00	137	0.030	-30.46	-23.46	0.00
93	0.030	-30.46	-23.46	0.00	138	0.030	-30.46	-23.46	0.00
94	0.030	-30.46	-23.46	0.00	139	0.030	-30.46	-23.46	0.00
95	0.030	-30.46	-23.46	0.00	140	0.030	-30.46	-23.46	0.00
96	0.030	-30.46	-23.46	0.00	141	0.030	-30.46	-23.46	0.00
97	0.030	-30.46	-23.46	0.00	142	0.030	-30.46	-23.46	0.00
98	0.030	-30.46	-23.46	0.00	143	0.030	-30.46	-23.46	0.00
99	0.030	-30.46	-23.46	0.00	144	0.030	-30.46	-23.46	0.00
100	0.030	-30.46	-23.46	0.00	145	0.030	-30.46	-23.46	0.00
101	0.030	-30.46	-23.46	0.00	146	0.030	-30.46	-23.46	0.00
102	0.030	-30.46	-23.46	0.00	147	0.030	-30.46	-23.46	0.00
103	0.030	-30.46	-23.46	0.00	148	0.030	-30.46	-23.46	0.00
104	0.030	-30.46	-23.46	0.00	149	0.030	-30.46	-23.46	0.00
105	0.030	-30.46	-23.46	0.00	150	0.030	-30.46	-23.46	0.00
106	0.030	-30.46	-23.46	0.00	151	0.030	-30.46	-23.46	0.00
107	0.030	-30.46	-23.46	0.00	152	0.030	-30.46	-23.46	0.00
108	0.030	-30.46	-23.46	0.00	153	0.030	-30.46	-23.46	0.00
109	0.030	-30.46	-23.46	0.00	154	0.030	-30.46	-23.46	0.00
110	0.030	-30.46	-23.46	0.00	155	0.030	-30.46	-23.46	0.00
111	0.030	-30.46	-23.46	0.00	156	0.030	-30.46	-23.46	0.00
112	0.030	-30.46	-23.46	0.00	157	0.030	-30.46	-23.46	0.00
113	0.030	-30.46	-23.46	0.00	158	0.030	-30.46	-23.46	0.00
114	0.030	-30.46	-23.46	0.00	159	0.030	-30.46	-23.46	0.00
115	0.030	-30.46	-23.46	0.00	160	0.030	-30.46	-23.46	0.00
116	0.030	-30.46	-23.46	0.00	161	0.030	-30.46	-23.46	0.00
117	0.030	-30.46	-23.46	0.00	162	0.030	-30.46	-23.46	0.00
118	0.030	-30.46	-23.46	0.00	163	0.030	-30.46	-23.46	0.00
119	0.030	-30.46	-23.46	0.00	164	0.030	-30.46	-23.46	0.00
120	0.030	-30.46	-23.46	0.00	165	0.030	-30.46	-23.46	0.00
121	0.030	-30.46	-23.46	0.00	166	0.030	-30.46	-23.46	0.00
122	0.030	-30.46	-23.46	0.00	167	0.030	-30.46	-23.46	0.00
123	0.030	-30.46	-23.46	0.00	168	0.030	-30.46	-23.46	0.00
124	0.030	-30.46	-23.46	0.00	169	0.030	-30.46	-23.46	0.00
125	0.030	-30.46	-23.46	0.00	170	0.030	-30.46	-23.46	0.00
126	0.030	-30.46	-23.46	0.00	171	0.030	-30.46	-23.46	0.00
127	0.030	-30.46	-23.46	0.00	172	0.030	-30.46	-23.46	0.00
128	0.030	-30.46	-23.46	0.00	173	0.030	-30.46	-23.46	0.00
129	0.030	-30.46	-23.46	0.00	174	0.030	-30.46	-23.46	0.00
130	0.030	-30.46	-23.46	0.00	175	0.030	-30.46	-23.46	0.00
131	0.030	-30.46	-23.46	0.00	176	0.030	-30.46	-23.46	0.00
132	0.030	-30.46	-23.46	0.00	177	0.030	-30.46	-23.46	0.00
133	0.030	-30.46	-23.46	0.00	178	0.030	-30.46	-23.46	0.00
134	0.030	-30.46	-23.46	0.00	179	0.030	-30.46	-23.46	0.00

Exhibit 9
Copy of Manufacturer's Directional Antenna Documentation
(Actual Antenna Pattern rotated to 150.0°T) *(public record copy)*

KATHREIN
SCALA DIVISION

CL-FM
FM
Maximum gain: 7.0 dBd
Vertical polarization Component

Horizontal radiation pattern
0 degree electrical downtilt

Angle	Field	Rel.dB	dBd	PwrMult	Angle	Field	Rel.dB	dBd	PwrMult
180	0.030	-30.46	-23.46	0.00	225	0.030	-30.46	-23.46	0.00
181	0.030	-30.46	-23.46	0.00	226	0.030	-30.46	-23.46	0.00
182	0.030	-30.46	-23.46	0.00	227	0.030	-30.46	-23.46	0.00
183	0.030	-30.46	-23.46	0.00	228	0.030	-30.46	-23.46	0.00
184	0.030	-30.46	-23.46	0.00	229	0.030	-30.46	-23.46	0.00
185	0.030	-30.46	-23.46	0.00	230	0.030	-30.46	-23.46	0.00
186	0.030	-30.46	-23.46	0.00	231	0.030	-30.46	-23.46	0.00
187	0.030	-30.46	-23.46	0.00	232	0.030	-30.46	-23.46	0.00
188	0.030	-30.46	-23.46	0.00	233	0.030	-30.46	-23.46	0.00
189	0.030	-30.46	-23.46	0.00	234	0.030	-30.46	-23.46	0.00
190	0.030	-30.46	-23.46	0.00	235	0.030	-30.46	-23.46	0.00
191	0.030	-30.46	-23.46	0.00	236	0.030	-30.46	-23.46	0.00
192	0.030	-30.46	-23.46	0.00	237	0.030	-30.46	-23.46	0.00
193	0.030	-30.46	-23.46	0.00	238	0.030	-30.46	-23.46	0.00
194	0.030	-30.46	-23.46	0.00	239	0.030	-30.46	-23.46	0.00
195	0.030	-30.46	-23.46	0.00	240	0.030	-30.46	-23.46	0.00
196	0.030	-30.46	-23.46	0.00	241	0.030	-30.46	-23.46	0.00
197	0.030	-30.46	-23.46	0.00	242	0.030	-30.46	-23.46	0.00
198	0.030	-30.46	-23.46	0.00	243	0.030	-30.46	-23.46	0.00
199	0.030	-30.46	-23.46	0.00	244	0.030	-30.46	-23.46	0.00
200	0.030	-30.46	-23.46	0.00	245	0.030	-30.46	-23.46	0.00
201	0.030	-30.46	-23.46	0.00	246	0.030	-30.46	-23.46	0.00
202	0.030	-30.46	-23.46	0.00	247	0.030	-30.46	-23.46	0.00
203	0.030	-30.46	-23.46	0.00	248	0.030	-30.46	-23.46	0.00
204	0.030	-30.46	-23.46	0.00	249	0.030	-30.46	-23.46	0.00
205	0.030	-30.46	-23.46	0.00	250	0.030	-30.46	-23.46	0.00
206	0.030	-30.46	-23.46	0.00	251	0.030	-30.46	-23.46	0.00
207	0.030	-30.46	-23.46	0.00	252	0.030	-30.46	-23.46	0.00
208	0.030	-30.46	-23.46	0.00	253	0.030	-30.46	-23.46	0.00
209	0.030	-30.46	-23.46	0.00	254	0.030	-30.46	-23.46	0.00
210	0.030	-30.46	-23.46	0.00	255	0.030	-30.46	-23.46	0.00
211	0.030	-30.46	-23.46	0.00	256	0.030	-30.46	-23.46	0.00
212	0.030	-30.46	-23.46	0.00	257	0.030	-30.46	-23.46	0.00
213	0.030	-30.46	-23.46	0.00	258	0.030	-30.46	-23.46	0.00
214	0.030	-30.46	-23.46	0.00	259	0.030	-30.46	-23.46	0.00
215	0.030	-30.46	-23.46	0.00	260	0.030	-30.46	-23.46	0.00
216	0.030	-30.46	-23.46	0.00	261	0.030	-30.46	-23.46	0.00
217	0.030	-30.46	-23.46	0.00	262	0.030	-30.46	-23.46	0.00
218	0.030	-30.46	-23.46	0.00	263	0.030	-30.46	-23.46	0.00
219	0.030	-30.46	-23.46	0.00	264	0.030	-30.46	-23.46	0.00
220	0.030	-30.46	-23.46	0.00	265	0.030	-30.46	-23.46	0.00
221	0.030	-30.46	-23.46	0.00	266	0.030	-30.46	-23.46	0.00
222	0.030	-30.46	-23.46	0.00	267	0.030	-30.46	-23.46	0.00
223	0.030	-30.46	-23.46	0.00	268	0.030	-30.46	-23.46	0.00
224	0.030	-30.46	-23.46	0.00	269	0.030	-30.46	-23.46	0.00

Exhibit 9
Copy of Manufacturer's Directional Antenna Documentation
(Actual Antenna Pattern rotated to 150.0°T) *(public record copy)*

KATHREIN
SCALA DIVISION

CL-FM
FM
Maximum gain: 7.0 dBd
Vertical polarization Component

Horizontal radiation pattern
0 degree electrical downtilt

Angle	Field	Rel.dB	dBd	PwrMult	Angle	Field	Rel.dB	dBd	PwrMult
270	0.030	-30.46	-23.46	0.00	315	0.618	-4.19	2.81	1.91
271	0.030	-30.46	-23.46	0.00	316	0.632	-3.99	3.01	2.00
272	0.030	-30.46	-23.46	0.00	317	0.646	-3.79	3.21	2.09
273	0.030	-30.46	-23.46	0.00	318	0.661	-3.60	3.40	2.19
274	0.030	-30.46	-23.46	0.00	319	0.675	-3.41	3.59	2.29
275	0.030	-30.46	-23.46	0.00	320	0.690	-3.22	3.78	2.39
276	0.034	-29.37	-22.37	0.01	321	0.704	-3.05	3.95	2.48
277	0.038	-28.40	-21.40	0.01	322	0.716	-2.90	4.10	2.57
278	0.042	-27.54	-20.54	0.01	323	0.729	-2.74	4.26	2.67
279	0.046	-26.74	-19.74	0.01	324	0.742	-2.59	4.41	2.76
280	0.050	-26.02	-19.02	0.01	325	0.756	-2.44	4.56	2.86
281	0.062	-24.15	-17.15	0.02	326	0.767	-2.30	4.70	2.95
282	0.074	-22.62	-15.62	0.03	327	0.781	-2.15	4.85	3.05
283	0.086	-21.31	-14.31	0.04	328	0.793	-2.02	4.98	3.15
284	0.098	-20.18	-13.18	0.05	329	0.806	-1.88	5.12	3.25
285	0.110	-19.17	-12.17	0.06	330	0.817	-1.75	5.25	3.35
286	0.126	-17.99	-10.99	0.08	331	0.829	-1.63	5.37	3.44
287	0.142	-16.95	-9.95	0.10	332	0.840	-1.52	5.48	3.53
288	0.158	-16.03	-9.03	0.13	333	0.851	-1.41	5.59	3.63
289	0.174	-15.19	-8.19	0.15	334	0.862	-1.29	5.71	3.72
290	0.190	-14.42	-7.42	0.18	335	0.873	-1.18	5.82	3.82
291	0.212	-13.47	-6.47	0.23	336	0.882	-1.10	5.90	3.89
292	0.234	-12.62	-5.62	0.27	337	0.890	-1.01	5.99	3.97
293	0.256	-11.84	-4.84	0.33	338	0.899	-0.92	6.08	4.05
294	0.278	-11.12	-4.12	0.39	339	0.908	-0.84	6.16	4.13
295	0.300	-10.46	-3.46	0.45	340	0.916	-0.76	6.24	4.21
296	0.318	-9.95	-2.95	0.51	341	0.923	-0.69	6.31	4.27
297	0.336	-9.47	-2.47	0.57	342	0.931	-0.62	6.38	4.34
298	0.354	-9.02	-2.02	0.63	343	0.938	-0.56	6.44	4.41
299	0.372	-8.59	-1.59	0.69	344	0.946	-0.49	6.51	4.48
300	0.390	-8.18	-1.18	0.76	345	0.952	-0.42	6.58	4.55
301	0.405	-7.84	-0.84	0.82	346	0.958	-0.37	6.63	4.60
302	0.421	-7.51	-0.51	0.89	347	0.964	-0.32	6.68	4.65
303	0.436	-7.20	-0.20	0.95	348	0.969	-0.27	6.73	4.71
304	0.452	-6.90	0.10	1.02	349	0.975	-0.22	6.78	4.76
305	0.467	-6.60	0.40	1.10	350	0.980	-0.18	6.82	4.81
306	0.483	-6.33	0.67	1.17	351	0.982	-0.15	6.85	4.84
307	0.498	-6.06	0.94	1.24	352	0.985	-0.13	6.87	4.87
308	0.513	-5.80	1.20	1.32	353	0.988	-0.10	6.90	4.89
309	0.528	-5.54	1.46	1.40	354	0.991	-0.08	6.92	4.92
310	0.544	-5.30	1.70	1.48	355	0.993	-0.06	6.94	4.95
311	0.558	-5.06	1.94	1.56	356	0.995	-0.04	6.96	4.96
312	0.573	-4.84	2.16	1.65	357	0.996	-0.03	6.97	4.97
313	0.588	-4.61	2.39	1.73	358	0.997	-0.02	6.98	4.99
314	0.602	-4.40	2.60	1.82	359	0.998	-0.01	6.99	5.00