Technical Report Supporting a Form 349 Minor Construction Permit Application

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

for

W262CL.L - Brattleboro, VT
License Pending
(Facility ID: 140890)

"New Site Location and New Directional Antenna Pattern"

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as a

Commercial, Fill-In AM Translator for WKVT(AM) - Brattleboro, VT

April, 2017

Asher Broadcast Consulting, LLC
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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 pending). This FCC Form 349 Filing requests a change in site locations and new directional antenna pattern. Continued operation on CH262D (100.3 MHz) with a power of 0.250 kW ERP (circular polarization) is requested from a new site location and new antenna COR of 594 meters AMSL. This Form 349 Filing will continue to specify rebroadcast of Class C, AM Primary Station WKVT(AM) - Brattleboro, VT (1490 kHz); Facility ID No. 57781. 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 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 an existing 30.0 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 102.10 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 three 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-c)***. It is believed sufficient clearance exists, precluding the need for additional contour protection showings.

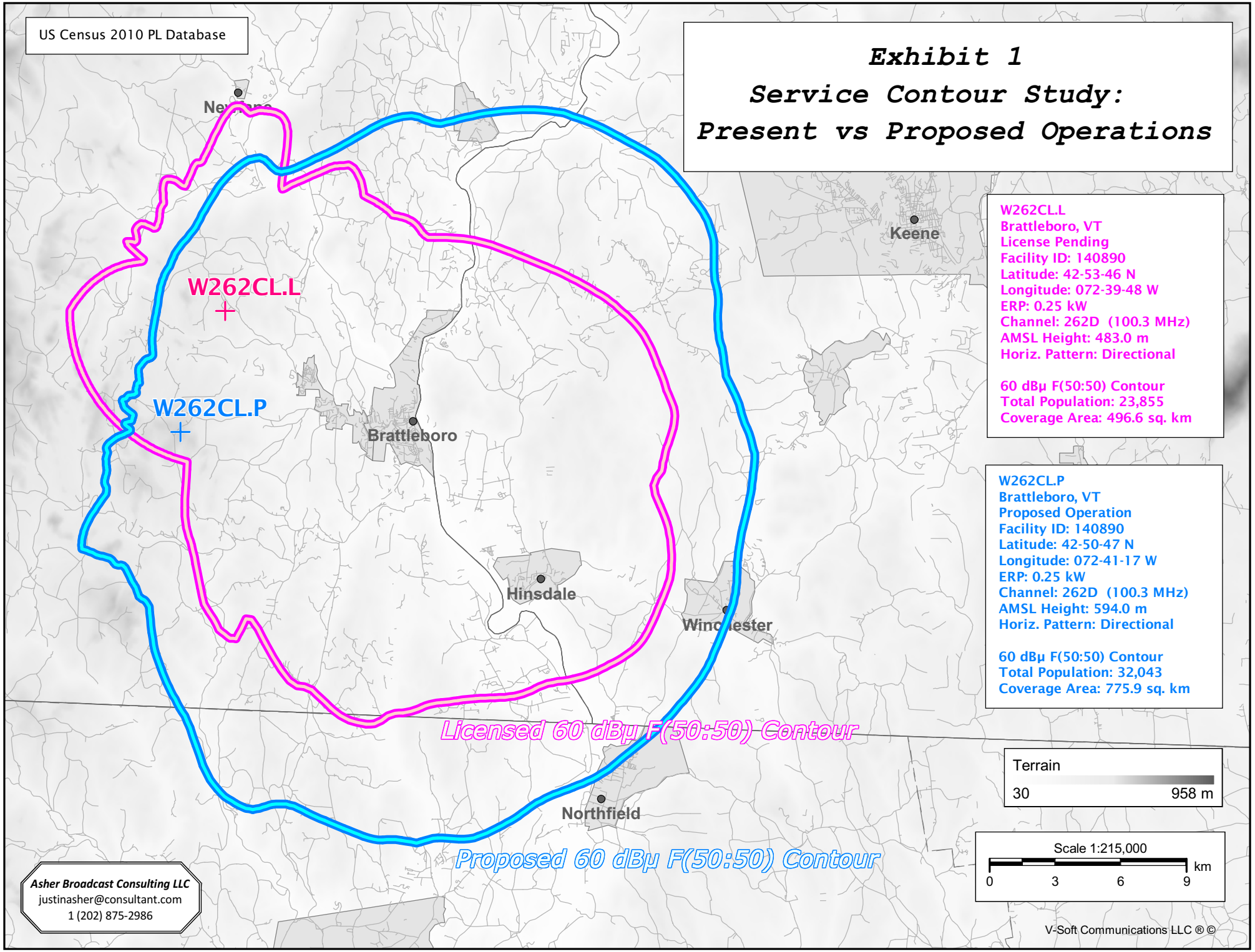
Regarding protection of international concerns, the facility is and will remain within 320 km from the common border between the United States and Canada. However full protection will be afforded all Canadian concerns as noted in ***Exhibit 6***.

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 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 eighteen 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
April 15, 2017


US Census 2010 PL Database
Exhibit 1
Service Contour Study:
Present vs Proposed Operations
W262CL.L
Brattleboro, VT
License Pending
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: 23,855
Coverage Area: 496.6 sq. km
W262CL.P
Brattleboro, VT
Proposed Operation
Facility ID: 140890
Latitude: 42-50-47 N
Longitude: 072-41-17 W
ERP: 0.25 kW
Channel: 262D (100.3 MHz)
AMSL Height: 594.0 m
Horiz. Pattern: Directional
60 dBµ F(50:50) Contour
Total Population: 32,043
Coverage Area: 775.9 sq. km
W262CL.L
W262CL.P
Keene
Brattleboro
Hinsdale
Winchester
Northfield
Licensed 60 dBµ F(50:50) Contour
Proposed 60 dBµ F(50:50) Contour
Terrain
30
958 m
Scale 1:215,000
0
3
6
9
km
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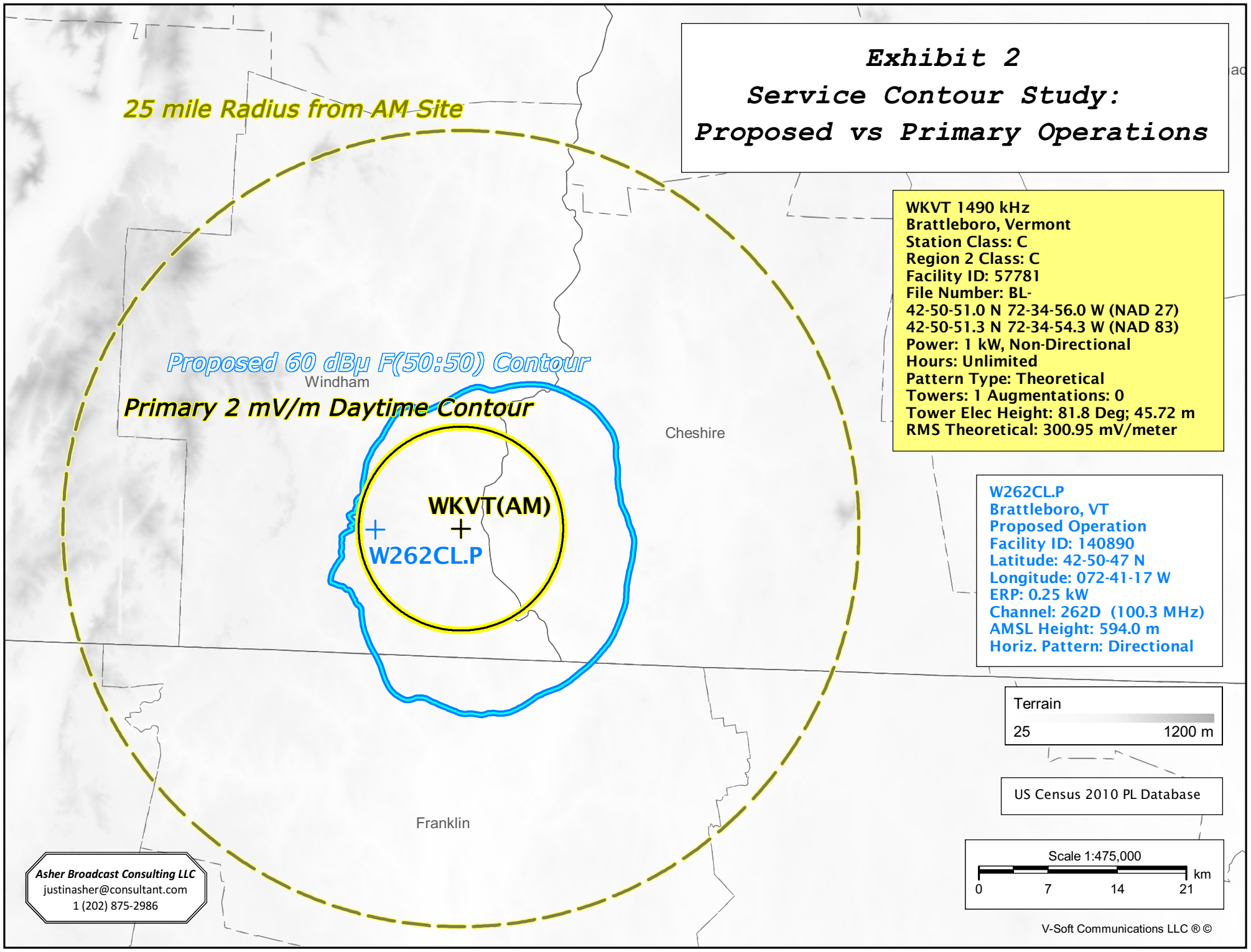
Exhibit 2
Service Contour Study:
Proposed vs Primary Operations
25 mile Radius from AM Site
Proposed 60 dBμ F(50:50) Contour
Primary 2 mV/m Daytime Contour
Windham
Cheshire
Franklin
WKVT(AM)
W262CL.P
WKVT 1490 kHz
Brattleboro, Vermont
Station Class: C
Region 2 Class: C
Facility ID: 57781
File Number: BL-
42-50-51.0 N 72-34-56.0 W (NAD 27)
42-50-51.3 N 72-34-54.3 W (NAD 83)
Power: 1 kW, Non-Directional
Hours: Unlimited
Pattern Type: Theoretical
Towers: 1 Augmentations: 0
Tower Elec Height: 81.8 Deg; 45.72 m
RMS Theoretical: 300.95 mV/meter
W262CL.P
Brattleboro, VT
Proposed Operation
Facility ID: 140890
Latitude: 42-50-47 N
Longitude: 072-41-17 W
ERP: 0.25 kW
Channel: 262D (100.3 MHz)
AMSL Height: 594.0 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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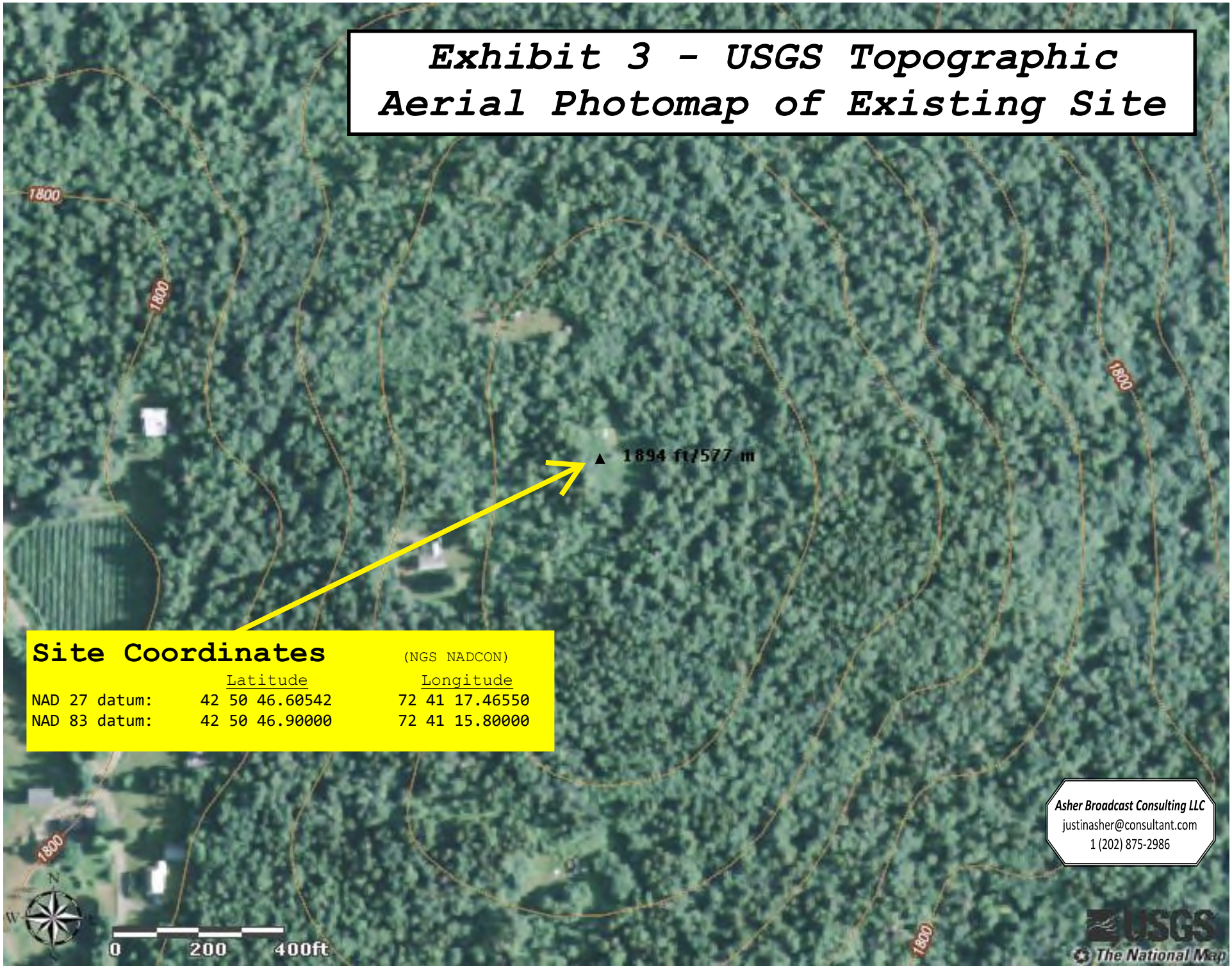
Exhibit 3 - USGS Topographic
Aerial Photomap of Existing Site
1894 ft/577 m
1800
Site Coordinates
(NGS NADCON)
Latitude
Longitude
NAD 27 datum: 42 50 46.60542 72 41 17.46550
NAD 83 datum: 42 50 46.90000 72 41 15.80000
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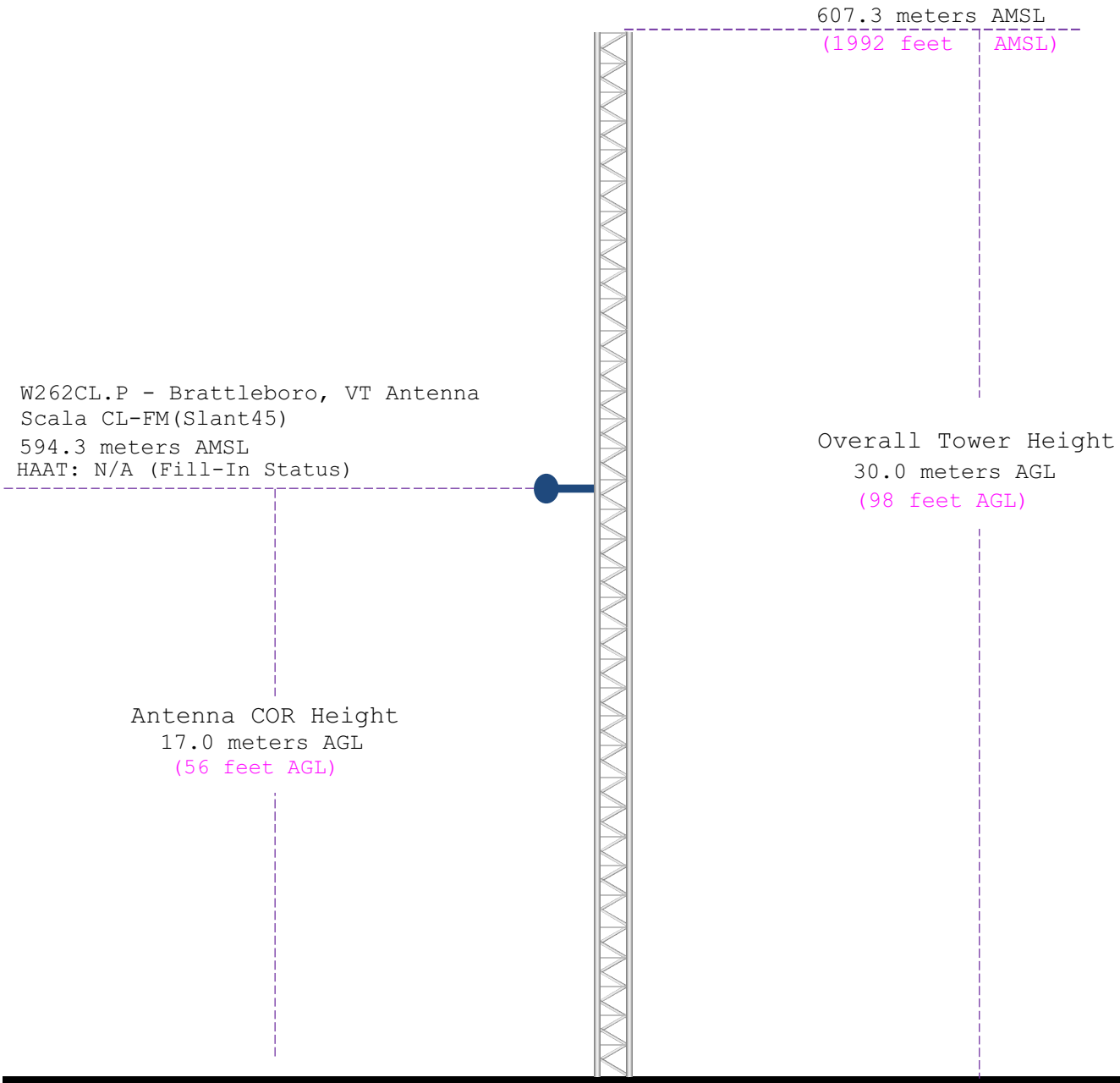
0 200 400ft
USGS
The National Map

Exhibit 4
Vertical Plan of Antenna System



Ground Elevation: 577.3 meters AMSL (1894 feet AMSL)

Address: 0.3 km east of the "Y" Intersection of Cow Path 40 Rd & Lower-Houghton Rd
City: Brattleboro
County: Windham
State: Vermont

	Latitude (D M S)	Longitude (D M S)
NAD 27 datum values:	42 50 46.60542	72 41 17.46550
NAD 83 datum values:	42 50 46.90000	72 41 15.80000

Antenna Structure Registration
Not Required

Drawing Is Not To Scale

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Exhibit 5
HAAT and Miscellaneous Coordinate Information

HAAT Calculation (1927): (from fcc.gov)

Antenna Height Above Average Terrain Calculations -- Results

Input Data

Latitude **42° 50' 47"** North
Longitude **72° 41' 17"** West (NAD 27)
These coordinates convert to NAD 83 coordinates of
42° 50' 47.29", North, 72° 41' 15.33" West (NAD 83).
Height of antenna radiation center above mean sea level: **594** meters AMSL
Number of Evenly Spaced Radials = **12** 0° is referenced to True North

Results

Calculated HAAT = **215 meters**

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

Individual "Radial HAAT" Values, in meters

0°	222.5 m	30°	260.8 m
60°	390.8 m	90°	386.1 m
120°	378.0 m	150°	262.7 m
180°	208.6 m	210°	128.4 m
240°	91.7 m	270°	44.3 m
300°	46.3 m	330°	155.7 m

	Latitude	Longitude
NAD 27 datum values:	42 50 46.60542	72 41 17.46550
NAD 83 datum values:	42 50 46.90000	72 41 15.80000

Various Coordinate Conversion Calculations (NAD 1983):

Position Type	Lat Lon
Degrees Lat Long	42.8463611°, -072.6877222°
Degrees Minutes	42°50.78167', -072°41.26333'
Degrees Minutes Seconds	42°50'46.9000", -072°41'15.8000"
UTM	18T 688942mE 4746347mN
UTM centimeter	18T 688942.79mE 4746347.10mN
MGRS	18TXN8894246347
Grid North	1.6°
GARS	215MB24
Maidenhead	FN32PU73LD30
GEOREF	HJCN18735078

Exhibit 6
Tabulation of Proposed Allocation

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

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 102.10 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= 225.7 M, COR= 594 M DISPLAY DATES
42 50 47.0 N. Average Protected F(50-50)= 19.66 km DATA 03-14-17
72 41 17.0 W. Standard Directional SEARCH 03-14-17

CH CALL / CITY	TYPE ANT / STATE	AZI <--	DIST / FILE #	LAT / LNG	PWR(kW) / HAAT(M)	INT(km) / COR(M)	PRO(km) / LICENSEE	*IN* (Overlap in km)	*OUT*
262D W262CL	LIC DC_	19.9	5.84	42 53 45.0	0.105	13.3	4.2	-20.2*	-40.8*
Brattleboro	VT	199.9	BMLFT20140422AAQ	72 39 49.0	146	483	Saga Communications Of New		
262B1 WFFG-FM	LIC _CN	306.6	107.90	43 25 12.0	1.450	114.5	51.2	-9.4*<	46.1
Warrensburg	NY	125.9	BLH19950606KC	73 45 39.0	400	680	6 Johnson Road Licenses, I		
Notified to Canada 960805									
264A WTHK	LIC _C_	303.3	22.86	42 57 33.0	0.130	0.8	25.7	19.2	-2.9*<
Wilmington	VT	123.2	BLH19991215ABK	72 55 22.0	452	1107	Great Eastern Radio, Llc		
262B WHEB	LIC _CN	81.0	157.94	43 03 11.0	50.000	135.0	62.2	-2.1<	2.4
Portsmouth	NH	262.3	BLH19910307KE	70 46 04.0	140	151	Capstar Tx, Llc		
259D W259AB	LIC _HN	275.1	8.70	42 51 12.0	0.006	0.2	8.4	6.1	0.2
Marlboro, Etc.	VT	95.1	BLFT19930126TE	72 47 40.0	187	687	Brian Dodge D/b/a Harvest		
Translator for WVAY, Willmington, VT-Horizontal Polarization Only									
261A WUPE-FM	LIC NCX	242.0	34.89	42 41 54.0	1.150	29.1	19.7	2.0<	9.7
North Adams	MA	61.7	BLH20151014ABU	73 03 54.0	159	677	Berkshire Broadcasting Co.		
263C3 WXXK	LIC NCN	19.4	95.36	43 39 18.0	22.000	71.4	48.4	11.3	28.0
Lebanon	NH	199.6	BLH19970307KF	72 17 42.0	99	375	Great Eastern Radio, Llc		
260A WFNX	LIC _CN	125.0	48.70	42 35 39.0	1.850	2.2	24.8	21.4	22.8
Athol	MA	305.3	BLH19891204KC	72 12 02.0	124	396	County Broadcasting Compan		
265A WRNX	LIC ZEX	176.9	66.18	42 15 07.0	0.870	1.9	30.4	49.9	35.3
Amherst	MA	356.9	BLH20120110ADN	72 38 41.0	262	364	Cc Licenses, Llc		
263B WRCH	LIC _CX	185.4	127.60	41 42 13.0	7.500	80.8	67.9	36.3	37.6
New Britain	CT	5.3	BMLH20090430AAN	72 49 57.0	381	475	Cbs Radio Stations Inc.		
261A WWFX	LIC ZCN	136.0	95.67	42 13 28.0	2.850	18.3	12.4	53.9	48.1
Southbridge	MA	316.5	BLH19990209KB	71 52 51.0	146	359	Radio License Holding Cbc,		
Approved by Canada 990303									

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 - 03-14-2017 - FCC NGDC 30 Sec
W262CL.P's Overlaps (In= -2.07 km, Out= 2.37 km)

W262CL.P CH 262 D DA
Lat= 42 50 47.0, Lng= 72 41 17.0
0.25 kW 225.7 m HAAT, 594 m COR
Prot.= 60 dBu, Intef.= 34 dBu

WHEB CH 262 B BLH19910307KE
Lat= 43 03 11.0, Lng= 70 46 04.0
50.0 kW 140 m HAAT, 151 m COR
Prot.= 54 dBu, Intef.= 40 dBu

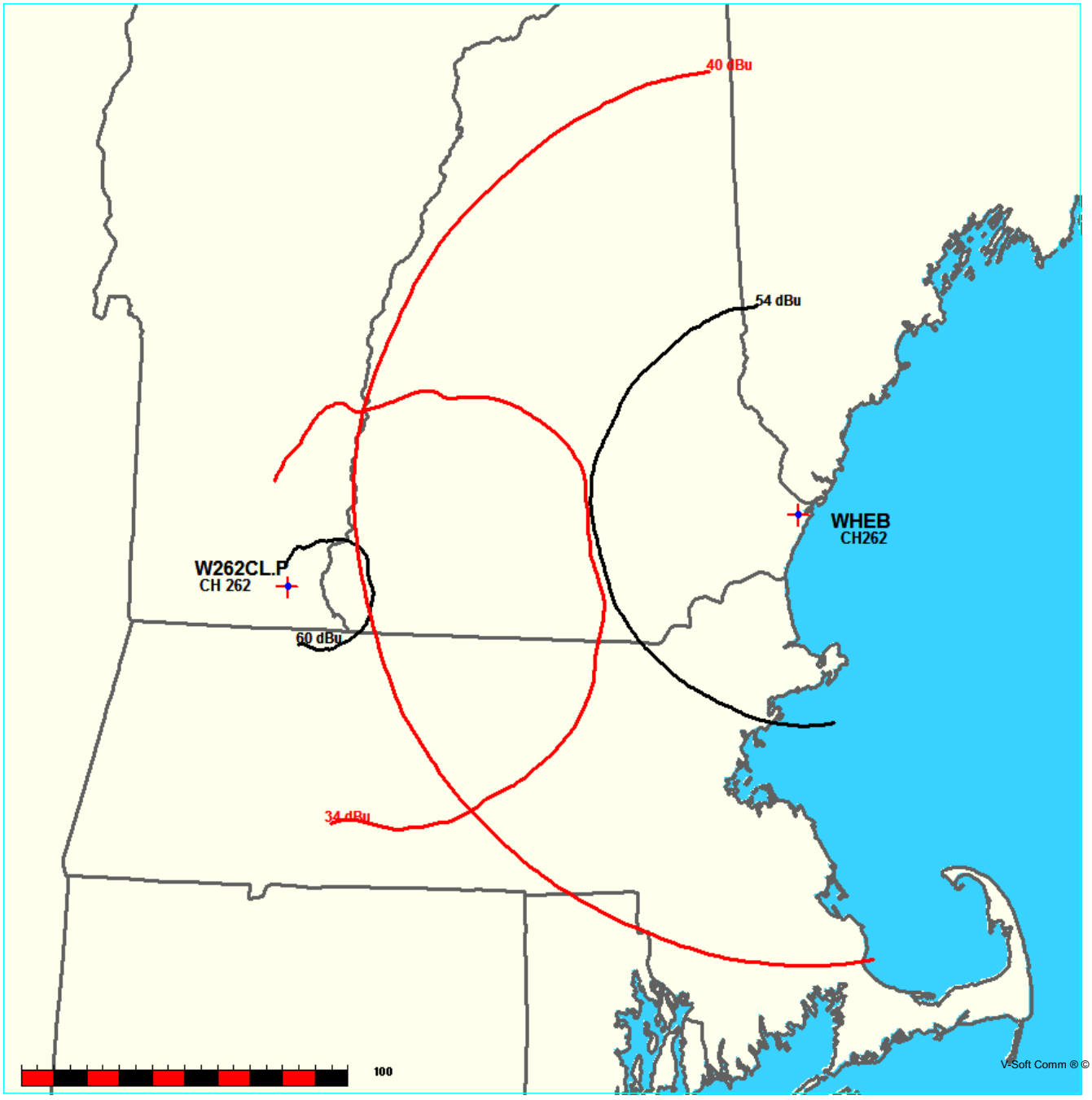

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Exhibit 7a
Contour Protection Studies Toward Select Allocation Concern(s)

03-14-2017 Terrain Data: FCC NGDC 30 Sec FMOver Analysis

W262CL.P	WHEB BLH19910307KE
Channel = 262D	Channel = 262B
Max ERP = 0.25 kW	Max ERP = 50 kW
RCAMSL = 594 m	RCAMSL = 151 m
N. Lat. 42 50 47.0	N. Lat. 43 03 11.0
W. Lng. 72 41 17.0	W. Lng. 70 46 04.0
Protected	Interfering
60 dBu	40 dBu

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)	IX (km)
040.0	000.0900	0329.5	018.4	267.1	050.0000	0134.3	144.6	38.27	
041.0	000.0961	0335.1	018.8	267.1	050.0000	0134.4	144.0	38.38	
042.0	000.1024	0342.4	019.3	267.2	050.0000	0134.4	143.4	38.48	
043.0	000.1089	0349.7	019.8	267.2	050.0000	0134.4	142.8	38.60	
044.0	000.1156	0356.4	020.3	267.2	050.0000	0134.4	142.2	38.71	
045.0	000.1225	0362.4	020.8	267.2	050.0000	0134.4	141.7	38.81	
046.0	000.1296	0367.7	021.2	267.2	050.0000	0134.4	141.1	38.92	
047.0	000.1369	0372.6	021.6	267.2	050.0000	0134.4	140.5	39.03	
048.0	000.1444	0376.4	022.0	267.2	050.0000	0134.4	140.0	39.13	
049.0	000.1521	0379.2	022.4	267.2	050.0000	0134.4	139.5	39.23	
050.0	000.1600	0382.1	022.7	267.1	050.0000	0134.4	139.0	39.33	
051.0	000.1640	0385.5	022.9	267.0	050.0000	0134.3	138.5	39.41	
052.0	000.1681	0390.0	023.2	267.0	050.0000	0134.3	138.1	39.50	
053.0	000.1722	0394.1	023.5	266.9	050.0000	0134.2	137.7	39.58	
054.0	000.1764	0397.6	023.7	266.8	050.0000	0134.1	137.3	39.66	
055.0	000.1806	0400.2	023.9	266.7	050.0000	0134.0	136.9	39.74	
056.0	000.1849	0403.2	024.1	266.6	050.0000	0134.0	136.5	39.81	
057.0	000.1892	0406.8	024.3	266.5	050.0000	0133.9	136.1	39.89	
058.0	000.1936	0410.6	024.6	266.3	050.0000	0133.8	135.7	39.97	
059.0	000.1980	0414.3	024.8	266.2	050.0000	0133.7	135.2	40.05*	0.24
060.0	000.2025	0417.6	025.0	266.1	050.0000	0133.6	134.9	40.12*	0.61
061.0	000.2048	0420.5	025.2	266.0	050.0000	0133.5	134.5	40.18*	0.91
062.0	000.2070	0423.1	025.3	265.8	050.0000	0133.4	134.2	40.24*	1.20
063.0	000.2093	0424.9	025.5	265.7	050.0000	0133.2	134.0	40.29*	1.46
064.0	000.2116	0426.1	025.6	265.5	050.0000	0133.1	133.7	40.33*	1.69
065.0	000.2139	0426.8	025.6	265.3	050.0000	0133.0	133.5	40.38*	1.90
066.0	000.2162	0427.6	025.7	265.2	050.0000	0132.8	133.3	40.42*	2.11
067.0	000.2186	0428.4	025.8	265.0	050.0000	0132.7	133.0	40.46*	2.31
068.0	000.2209	0427.8	025.9	264.8	050.0000	0132.5	132.9	40.49*	2.46
069.0	000.2233	0425.0	025.9	264.6	050.0000	0132.4	132.8	40.50*	2.54
070.0	000.2256	0421.3	025.8	264.4	050.0000	0132.2	132.7	40.51*	2.58
071.0	000.2256	0416.9	025.7	264.2	050.0000	0132.0	132.7	40.50*	2.53

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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)	
072.0	000.2256	0411.2	025.5	264.0	050.0000	0131.7	132.8	40.48*	2.42
073.0	000.2256	0406.6	025.4	263.8	050.0000	0131.5	132.8	40.46*	2.34
074.0	000.2256	0403.8	025.3	263.6	050.0000	0131.3	132.9	40.45*	2.30
075.0	000.2256	0403.1	025.3	263.4	050.0000	0131.1	132.8	40.46*	2.32
076.0	000.2256	0401.4	025.2	263.2	050.0000	0131.0	132.8	40.45*	2.30
077.0	000.2256	0397.1	025.1	263.0	050.0000	0130.8	132.9	40.43*	2.20
078.0	000.2256	0392.8	025.0	262.9	050.0000	0130.7	133.0	40.41*	2.09
079.0	000.2256	0390.8	024.9	262.7	050.0000	0130.7	133.0	40.40*	2.04
080.0	000.2256	0389.7	024.9	262.5	050.0000	0130.6	133.0	40.40*	2.02
081.0	000.2280	0389.4	025.0	262.3	050.0000	0130.5	133.0	40.41*	2.07
082.0	000.2304	0388.0	025.0	262.1	050.0000	0130.5	133.0	40.41*	2.07
083.0	000.2328	0385.4	025.0	261.9	050.0000	0130.4	133.0	40.40*	2.03
084.0	000.2352	0384.1	025.0	261.7	050.0000	0130.2	133.0	40.40*	2.02
085.0	000.2377	0387.5	025.2	261.5	050.0000	0130.1	132.9	40.42*	2.13
086.0	000.2401	0391.3	025.3	261.3	050.0000	0130.0	132.7	40.44*	2.25
087.0	000.2426	0394.4	025.5	261.1	050.0000	0129.9	132.6	40.46*	2.34
088.0	000.2450	0395.4	025.6	260.9	050.0000	0129.8	132.6	40.46*	2.35
089.0	000.2475	0398.2	025.7	260.7	050.0000	0129.7	132.5	40.47*	2.41
090.0	000.2500	0402.6	025.9	260.5	050.0000	0129.6	132.4	40.49*	2.51
091.0	000.2500	0407.0	026.0	260.3	050.0000	0129.5	132.4	40.50*	2.53
092.0	000.2500	0411.6	026.2	260.1	050.0000	0129.4	132.3	40.50*	2.55
093.0	000.2500	0412.2	026.2	259.9	050.0000	0129.2	132.4	40.48*	2.44
094.0	000.2500	0411.2	026.2	259.7	050.0000	0129.1	132.6	40.45*	2.28
095.0	000.2500	0410.7	026.2	259.6	050.0000	0129.0	132.7	40.42*	2.12
096.0	000.2500	0410.0	026.1	259.4	050.0000	0128.9	132.9	40.38*	1.95
097.0	000.2500	0408.8	026.1	259.2	050.0000	0128.8	133.1	40.35*	1.76
098.0	000.2500	0407.4	026.1	259.0	050.0000	0128.7	133.2	40.31*	1.55
099.0	000.2500	0405.7	026.0	258.8	050.0000	0128.6	133.5	40.26*	1.33
100.0	000.2500	0404.8	026.0	258.7	050.0000	0128.6	133.7	40.22*	1.13
101.0	000.2500	0405.1	026.0	258.5	050.0000	0128.5	133.8	40.19*	0.94
102.0	000.2500	0405.5	026.0	258.3	050.0000	0128.4	134.0	40.15*	0.76
103.0	000.2500	0407.4	026.1	258.1	050.0000	0128.3	134.1	40.12*	0.60
104.0	000.2500	0410.9	026.2	257.9	050.0000	0128.2	134.3	40.09*	0.47
105.0	000.2500	0414.3	026.3	257.7	050.0000	0128.2	134.4	40.07*	0.34
106.0	000.2500	0416.8	026.3	257.5	050.0000	0128.1	134.5	40.03*	0.17
107.0	000.2500	0418.1	026.4	257.4	050.0000	0128.0	134.7	39.99	
108.0	000.2500	0417.8	026.4	257.2	050.0000	0127.9	135.0	39.94	
109.0	000.2500	0417.2	026.3	257.0	050.0000	0127.9	135.3	39.89	
110.0	000.2500	0416.7	026.3	256.9	050.0000	0127.9	135.5	39.83	
111.0	000.2500	0416.2	026.3	256.7	050.0000	0127.8	135.8	39.78	
112.0	000.2500	0416.1	026.3	256.6	050.0000	0127.8	136.1	39.72	
113.0	000.2500	0416.2	026.3	256.4	050.0000	0127.8	136.3	39.67	
114.0	000.2500	0415.6	026.3	256.3	050.0000	0127.8	136.6	39.61	
115.0	000.2500	0414.1	026.3	256.1	050.0000	0127.8	137.0	39.55	
116.0	000.2500	0411.5	026.2	256.0	050.0000	0127.8	137.3	39.48	
117.0	000.2500	0408.1	026.1	255.9	050.0000	0127.8	137.7	39.40	

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

03-14-2017 Terrain Data: FCC NGDC 30 Sec FMOver Analysis

WHEB BLH19910307KE	W262CL.P
Channel = 262B	Channel = 262D
Max ERP = 50 kW	Max ERP = 0.25 kW
RCAMSL = 151 m	RCAMSL = 594 m
N. Lat. 43 03 11.0	N. Lat. 42 50 47.0
W. Lng. 70 46 04.0	W. Lng. 72 41 17.0
Protected	Interfering
54 dBu	34 dBu

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)	IX (km)
217.0	050.0000	0131.1	062.3	102.2	000.2500	0405.7	122.4	27.11	
218.0	050.0000	0130.9	062.3	102.0	000.2500	0405.5	121.4	27.35	
219.0	050.0000	0130.7	062.3	101.7	000.2500	0405.4	120.4	27.60	
220.0	050.0000	0130.3	062.2	101.5	000.2500	0405.3	119.5	27.84	
221.0	050.0000	0129.7	062.1	101.2	000.2500	0405.2	118.6	28.07	
222.0	050.0000	0129.2	062.0	100.9	000.2500	0405.1	117.7	28.30	
223.0	050.0000	0129.2	062.0	100.6	000.2500	0404.9	116.7	28.53	
224.0	050.0000	0129.2	062.0	100.4	000.2500	0404.8	115.8	28.77	
225.0	050.0000	0129.0	062.0	100.1	000.2500	0404.8	114.9	28.99	
226.0	050.0000	0128.6	062.0	099.7	000.2500	0404.9	114.1	29.22	
227.0	050.0000	0128.8	062.0	099.4	000.2500	0405.1	113.2	29.46	
228.0	050.0000	0129.5	062.1	099.1	000.2500	0405.5	112.2	29.71	
229.0	050.0000	0130.2	062.2	098.8	000.2500	0406.0	111.3	29.96	
230.0	050.0000	0130.7	062.3	098.5	000.2500	0406.5	110.4	30.21	
231.0	050.0000	0131.0	062.3	098.2	000.2500	0407.1	109.6	30.45	
232.0	050.0000	0131.2	062.3	097.8	000.2500	0407.8	108.8	30.68	
233.0	050.0000	0131.3	062.4	097.4	000.2500	0408.3	108.0	30.91	
234.0	050.0000	0131.2	062.3	097.0	000.2500	0408.8	107.2	31.12	
235.0	050.0000	0131.2	062.3	096.6	000.2500	0409.3	106.4	31.34	
236.0	050.0000	0131.3	062.4	096.1	000.2500	0409.9	105.7	31.55	
237.0	050.0000	0131.4	062.4	095.7	000.2500	0410.3	105.0	31.76	
238.0	050.0000	0131.2	062.4	095.2	000.2500	0410.6	104.3	31.95	
239.0	050.0000	0130.9	062.3	094.7	000.2500	0410.8	103.7	32.12	
240.0	050.0000	0130.8	062.3	094.2	000.2500	0411.1	103.1	32.30	
241.0	050.0000	0131.5	062.4	093.8	000.2500	0411.4	102.4	32.50	
242.0	050.0000	0132.7	062.6	093.3	000.2500	0411.9	101.6	32.73	
243.0	050.0000	0133.8	062.7	092.8	000.2500	0412.3	100.9	32.94	
244.0	050.0000	0134.2	062.8	092.3	000.2500	0412.4	100.3	33.11	
245.0	050.0000	0133.7	062.7	091.7	000.2500	0410.3	099.8	33.18	
246.0	050.0000	0132.7	062.6	091.1	000.2500	0407.7	099.4	33.20	
247.0	050.0000	0131.6	062.4	090.5	000.2500	0405.0	099.1	33.21	
248.0	050.0000	0130.7	062.3	089.9	000.2498	0402.3	098.8	33.21	
249.0	050.0000	0129.8	062.1	089.3	000.2483	0399.6	098.5	33.18	

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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)
250.0	050.0000	0129.3	062.0	088.7	000.2468	0396.9	098.2	33.16
251.0	050.0000	0128.9	062.0	088.1	000.2453	0395.4	097.9	33.17
252.0	050.0000	0128.8	062.0	087.5	000.2438	0395.1	097.6	33.22
253.0	050.0000	0128.6	062.0	086.9	000.2423	0394.1	097.3	33.24
254.0	050.0000	0128.3	061.9	086.3	000.2407	0392.2	097.1	33.21
255.0	050.0000	0128.0	061.9	085.6	000.2392	0389.9	096.9	33.17
256.0	050.0000	0127.8	061.8	085.0	000.2377	0387.5	096.7	33.12
257.0	050.0000	0127.9	061.8	084.4	000.2361	0385.1	096.5	33.07
258.0	050.0000	0128.3	061.9	083.7	000.2346	0384.0	096.3	33.06
259.0	050.0000	0128.7	062.0	083.1	000.2331	0385.2	096.1	33.12
260.0	050.0000	0129.3	062.1	082.5	000.2315	0386.8	096.0	33.20
261.0	050.0000	0129.8	062.1	081.8	000.2300	0388.4	095.8	33.26
262.0	050.0000	0130.4	062.2	081.2	000.2284	0389.2	095.7	33.29
263.0	050.0000	0130.8	062.3	080.5	000.2269	0389.6	095.7	33.29
264.0	050.0000	0131.7	062.4	079.9	000.2256	0389.8	095.6	33.30
265.0	050.0000	0132.7	062.6	079.2	000.2256	0390.5	095.5	33.34
266.0	050.0000	0133.5	062.7	078.5	000.2256	0391.5	095.5	33.38
267.0	050.0000	0134.3	062.8	077.9	000.2256	0393.2	095.5	33.43
268.0	050.0000	0134.9	062.9	077.2	000.2256	0396.0	095.6	33.50
269.0	050.0000	0135.9	063.0	076.6	000.2256	0399.2	095.6	33.58
270.0	050.0000	0136.9	063.2	075.9	000.2256	0401.7	095.7	33.64
271.0	050.0000	0138.0	063.4	075.2	000.2256	0402.9	095.8	33.64
272.0	050.0000	0139.0	063.5	074.6	000.2256	0403.2	095.9	33.61
273.0	050.0000	0140.0	063.7	073.9	000.2256	0403.9	096.1	33.58
274.0	050.0000	0140.5	063.7	073.3	000.2256	0405.6	096.4	33.55
275.0	050.0000	0140.6	063.7	072.7	000.2256	0408.0	096.8	33.52
276.0	050.0000	0140.6	063.7	072.0	000.2256	0411.0	097.2	33.50
277.0	050.0000	0141.1	063.8	071.4	000.2256	0414.7	097.6	33.50
278.0	050.0000	0141.8	063.9	070.8	000.2256	0417.9	098.0	33.49
279.0	050.0000	0142.5	064.0	070.2	000.2256	0420.5	098.4	33.45
280.0	050.0000	0143.1	064.1	069.6	000.2247	0422.9	098.8	33.38
281.0	050.0000	0143.1	064.1	069.0	000.2233	0424.9	099.4	33.25
282.0	050.0000	0142.8	064.1	068.5	000.2221	0426.6	100.0	33.10
283.0	050.0000	0142.3	064.0	068.0	000.2209	0427.8	100.7	32.93
284.0	050.0000	0141.6	063.9	067.5	000.2197	0428.4	101.4	32.72
285.0	050.0000	0141.0	063.8	067.0	000.2186	0428.5	102.1	32.50
286.0	050.0000	0140.4	063.7	066.6	000.2175	0428.1	102.9	32.26
287.0	050.0000	0139.8	063.6	066.1	000.2165	0427.6	103.6	32.01
288.0	050.0000	0139.3	063.5	065.7	000.2155	0427.2	104.4	31.77
289.0	050.0000	0138.5	063.4	065.3	000.2145	0426.9	105.2	31.52
290.0	050.0000	0137.7	063.3	064.9	000.2136	0426.7	106.1	31.27
291.0	050.0000	0137.0	063.2	064.5	000.2127	0426.5	106.9	31.01
292.0	050.0000	0136.4	063.1	064.1	000.2118	0426.2	107.8	30.76
293.0	050.0000	0135.9	063.1	063.7	000.2110	0425.8	108.6	30.50

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

Saga Communications Of New England, Inc.

FMCommander Single Allocation Study - 03-14-2017 - FCC NGDC 30 Sec
W262CL.P's Overlaps (In= 6.13 km, Out= 0.19 km)

W262CL.P CH 262 D DA
Lat= 42 50 47.0, Lng= 72 41 17.0
0.25 kW 225.7 m HAAT, 594 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

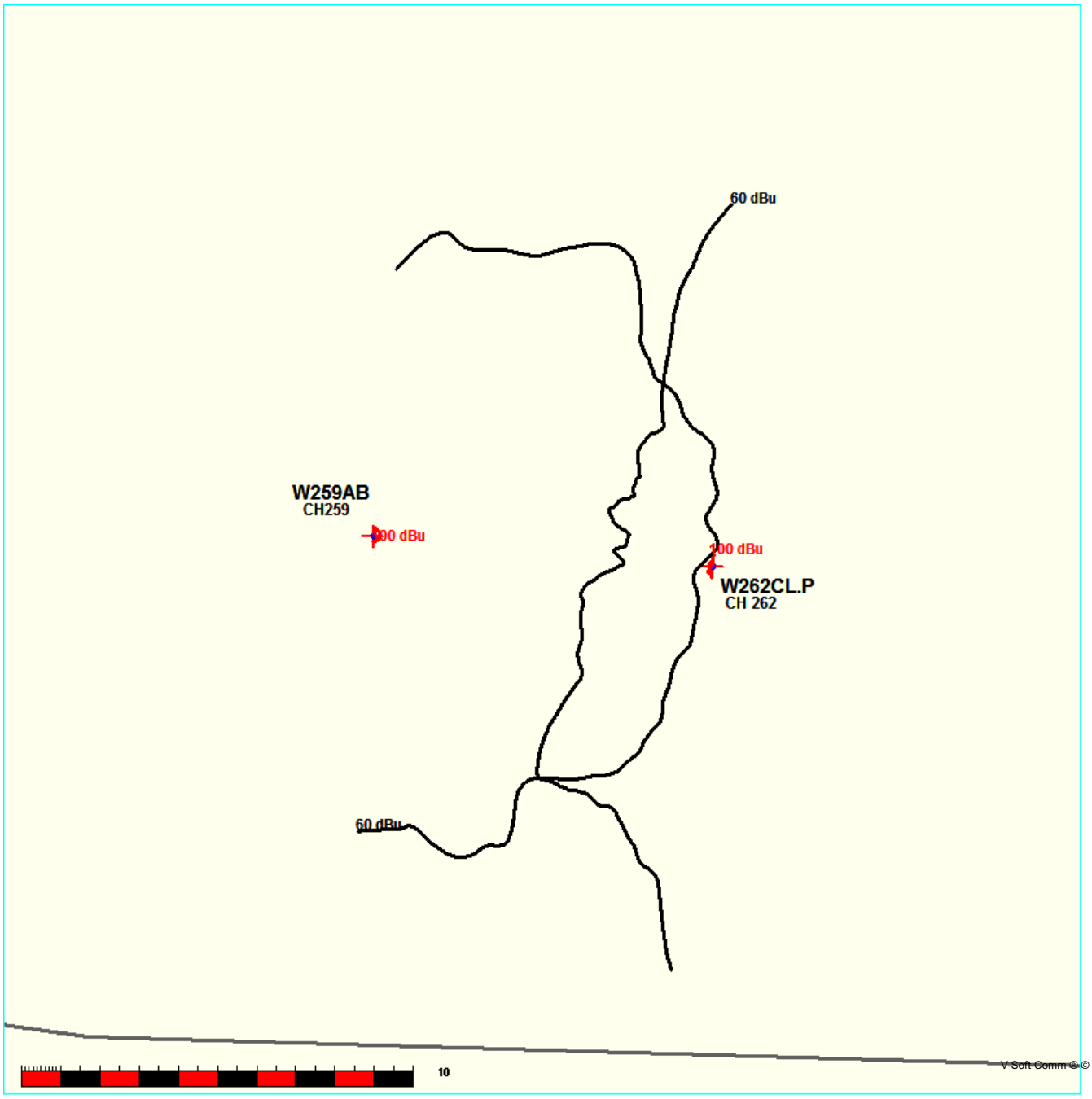

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Exhibit 7b
Contour Protection Studies Toward Select Allocation Concern(s)

03-14-2017 Terrain Data: FCC NGDC 30 Sec FMOver Analysis

W262CL.P

Channel = 262D
Max ERP = 0.25 kW
RCAMSL = 594 m
N. Lat. 42 50 47.0
W. Lng. 72 41 17.0
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)
233.0	000.0025	0107.9	004.2	122.0	000.0060	0289.3	006.3	64.70	
234.0	000.0025	0107.0	004.2	121.6	000.0060	0287.8	006.2	64.81	
235.0	000.0025	0106.5	004.2	121.2	000.0060	0286.4	006.1	64.92	
236.0	000.0025	0105.2	004.2	120.7	000.0060	0284.1	006.1	65.00	
237.0	000.0025	0103.0	004.1	120.0	000.0060	0281.0	006.0	65.03	
238.0	000.0025	0099.8	004.1	119.2	000.0060	0277.6	006.0	65.03	
239.0	000.0025	0096.0	004.0	118.2	000.0060	0275.6	006.0	65.04	
240.0	000.0025	0092.5	003.9	117.2	000.0060	0275.0	006.0	65.07	
241.0	000.0025	0089.8	003.8	116.4	000.0060	0274.4	005.9	65.11	
242.0	000.0025	0087.7	003.8	115.7	000.0060	0273.3	005.9	65.15	
243.0	000.0025	0086.2	003.8	115.0	000.0060	0271.9	005.9	65.20	
244.0	000.0025	0085.0	003.7	114.4	000.0060	0270.4	005.8	65.24	
245.0	000.0025	0084.1	003.7	113.9	000.0060	0269.3	005.8	65.30	
246.0	000.0025	0083.3	003.7	113.3	000.0060	0268.6	005.8	65.37	
247.0	000.0025	0082.5	003.7	112.7	000.0060	0268.6	005.7	65.45	
248.0	000.0025	0081.2	003.7	112.1	000.0060	0269.4	005.7	65.53	
249.0	000.0025	0080.2	003.6	111.4	000.0060	0271.2	005.7	65.63	
250.0	000.0025	0079.3	003.6	110.8	000.0060	0273.8	005.6	65.75	
251.0	000.0025	0077.9	003.6	110.1	000.0060	0276.9	005.6	65.85	
252.0	000.0025	0075.9	003.5	109.3	000.0060	0279.7	005.6	65.91	
253.0	000.0025	0073.4	003.5	108.5	000.0060	0281.1	005.6	65.92	
254.0	000.0025	0071.9	003.4	107.8	000.0060	0280.2	005.6	65.92	
255.0	000.0025	0071.9	003.4	107.3	000.0060	0278.9	005.6	65.97	
256.0	000.0025	0072.9	003.5	106.9	000.0060	0278.2	005.5	66.07	
257.0	000.0025	0072.9	003.5	106.3	000.0060	0277.8	005.5	66.14	
258.0	000.0025	0072.3	003.5	105.7	000.0060	0277.4	005.5	66.17	
259.0	000.0025	0070.2	003.4	104.9	000.0060	0276.9	005.5	66.13	
260.0	000.0025	0067.9	003.4	104.2	000.0060	0276.9	005.5	66.08	
261.0	000.0025	0064.8	003.3	103.3	000.0060	0277.5	005.6	66.00	
262.0	000.0025	0059.9	003.2	102.4	000.0060	0277.0	005.7	65.81	
263.0	000.0025	0055.3	003.1	101.5	000.0060	0276.3	005.7	65.57	
264.0	000.0025	0052.4	003.0	100.7	000.0060	0275.0	005.8	65.39	
265.0	000.0025	0049.2	002.9	100.0	000.0060	0272.3	005.9	65.18	

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)
266.0	000.0025	0044.8	002.8	099.3	000.0060	0268.1	006.0	64.83
267.0	000.0025	0040.4	002.6	098.5	000.0060	0265.2	006.1	64.46
268.0	000.0025	0037.1	002.5	097.9	000.0060	0263.7	006.2	64.19
269.0	000.0025	0034.5	002.4	097.4	000.0060	0263.1	006.3	64.01
270.0	000.0025	0032.0	002.3	096.9	000.0060	0262.7	006.4	63.83
271.0	000.0025	0029.4	002.3	096.5	000.0060	0263.0	006.4	63.71
272.0	000.0025	0027.9	002.3	096.2	000.0060	0264.2	006.4	63.75
273.0	000.0025	0028.8	002.3	095.8	000.0060	0266.3	006.4	63.81
274.0	000.0025	0031.0	002.3	095.5	000.0060	0268.9	006.4	63.95
275.0	000.0025	0033.3	002.4	095.1	000.0060	0271.7	006.3	64.18
276.0	000.0025	0035.8	002.5	094.7	000.0060	0274.8	006.2	64.43
277.0	000.0025	0037.5	002.5	094.3	000.0060	0278.4	006.2	64.63
278.0	000.0025	0038.7	002.6	093.8	000.0060	0282.1	006.1	64.79
279.0	000.0025	0038.7	002.6	093.4	000.0060	0285.6	006.1	64.86
280.0	000.0025	0036.3	002.5	093.1	000.0060	0288.3	006.2	64.72
281.0	000.0025	0033.2	002.4	092.8	000.0060	0290.6	006.3	64.55
282.0	000.0025	0029.6	002.3	092.6	000.0060	0292.5	006.4	64.36
283.0	000.0025	0026.3	002.3	092.3	000.0060	0295.6	006.5	64.40
284.0	000.0025	0023.6	002.3	091.9	000.0060	0298.6	006.5	64.44
285.0	000.0025	0022.1	002.3	091.6	000.0060	0299.9	006.5	64.44
286.0	000.0025	0021.8	002.3	091.2	000.0060	0298.8	006.5	64.40
287.0	000.0025	0021.5	002.3	090.9	000.0060	0296.8	006.5	64.35
288.0	000.0025	0022.3	002.3	090.6	000.0060	0294.8	006.5	64.29
289.0	000.0025	0024.5	002.3	090.2	000.0060	0292.8	006.5	64.22
290.0	000.0025	0029.4	002.3	089.9	000.0060	0290.9	006.5	64.16
291.0	000.0025	0034.3	002.4	089.1	000.0060	0286.2	006.4	64.30
292.0	000.0025	0039.3	002.6	088.2	000.0060	0280.4	006.3	64.47
293.0	000.0025	0043.8	002.7	087.2	000.0060	0276.5	006.2	64.63
294.0	000.0025	0046.4	002.8	086.5	000.0060	0280.6	006.1	64.84
295.0	000.0025	0048.0	002.9	085.9	000.0060	0285.0	006.1	64.97
296.0	000.0025	0049.5	002.9	085.3	000.0060	0289.2	006.1	65.07
297.0	000.0025	0051.7	003.0	084.6	000.0060	0293.9	006.1	65.21
298.0	000.0025	0053.1	003.0	084.0	000.0060	0298.2	006.1	65.29
299.0	000.0025	0053.1	003.0	083.6	000.0060	0300.6	006.1	65.26
300.0	000.0025	0051.3	003.0	083.4	000.0060	0301.2	006.2	65.12
301.0	000.0025	0049.6	002.9	083.3	000.0060	0301.5	006.2	64.99
302.0	000.0025	0049.3	002.9	083.0	000.0060	0301.7	006.3	64.91
303.0	000.0025	0049.5	002.9	082.6	000.0060	0301.5	006.3	64.84
304.0	000.0025	0049.4	002.9	082.2	000.0060	0300.9	006.3	64.76
305.0	000.0025	0048.7	002.9	082.0	000.0060	0300.4	006.4	64.65
306.0	000.0025	0047.2	002.8	082.0	000.0060	0300.3	006.4	64.51
307.0	000.0025	0045.4	002.8	082.0	000.0060	0300.4	006.5	64.36
308.0	000.0025	0043.6	002.7	082.0	000.0060	0300.5	006.6	64.22
309.0	000.0025	0042.6	002.7	082.0	000.0060	0300.3	006.6	64.10

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

03-14-2017 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 = 594 m
N. Lat. 42 51 12.0	N. Lat. 42 50 47.0
W. Lng. 72 47 40.0	W. Lng. 72 41 17.0
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)
050.0	000.0060	0306.1	008.9	344.2	000.0013	0213.4	006.8	54.68	
051.0	000.0060	0297.0	008.8	343.7	000.0012	0213.6	006.6	54.86	
052.0	000.0060	0288.6	008.7	343.2	000.0011	0213.2	006.4	54.98	
053.0	000.0060	0280.9	008.5	342.7	000.0010	0212.2	006.2	55.03	
054.0	000.0060	0273.7	008.4	342.1	000.0009	0210.7	006.0	55.03	
055.0	000.0060	0268.5	008.3	341.8	000.0009	0209.2	005.8	55.15	
056.0	000.0060	0266.1	008.3	341.8	000.0009	0209.3	005.7	55.57	
057.0	000.0060	0265.9	008.3	342.1	000.0009	0210.7	005.6	56.25	
058.0	000.0060	0265.8	008.3	342.5	000.0010	0211.8	005.4	56.93	
059.0	000.0060	0264.1	008.3	342.6	000.0010	0212.0	005.3	57.40	
060.0	000.0060	0261.7	008.2	342.5	000.0010	0211.8	005.1	57.75	
061.0	000.0060	0260.6	008.2	342.7	000.0010	0212.2	005.0	58.26	
062.0	000.0060	0262.5	008.2	343.4	000.0011	0213.3	004.8	59.13	
063.0	000.0060	0267.1	008.3	344.6	000.0013	0212.8	004.7	60.24	
064.0	000.0060	0272.6	008.4	346.0	000.0016	0210.4	004.6	61.36	
065.0	000.0060	0276.1	008.5	347.1	000.0018	0211.0	004.5	62.36	
066.0	000.0060	0277.6	008.5	347.8	000.0020	0213.3	004.3	63.21	
067.0	000.0060	0277.2	008.5	348.1	000.0021	0214.8	004.2	63.87	
068.0	000.0060	0276.4	008.5	348.3	000.0021	0216.0	004.0	64.50	
069.0	000.0060	0276.1	008.5	348.7	000.0022	0218.1	003.9	65.19	
070.0	000.0060	0277.6	008.5	349.4	000.0023	0223.3	003.7	66.13	
071.0	000.0060	0281.5	008.6	350.7	000.0029	0230.2	003.6	67.60	
072.0	000.0060	0286.8	008.6	352.4	000.0039	0229.1	003.5	69.39	
073.0	000.0060	0294.2	008.7	354.7	000.0054	0220.7	003.3	71.18	
074.0	000.0060	0302.0	008.9	357.2	000.0074	0216.2	003.2	72.90	
075.0	000.0060	0308.4	008.9	359.3	000.0094	0215.4	003.1	74.43	
076.0	000.0060	0310.1	009.0	000.5	000.0105	0213.1	002.9	75.48	
077.0	000.0060	0307.4	008.9	000.6	000.0106	0213.0	002.8	76.19	
078.0	000.0060	0302.9	008.9	000.1	000.0101	0214.0	002.6	76.74	
079.0	000.0060	0298.3	008.8	359.3	000.0094	0215.4	002.4	77.20	
080.0	000.0060	0297.2	008.8	359.6	000.0096	0214.9	002.3	78.06	
081.0	000.0060	0298.4	008.8	000.7	000.0107	0212.7	002.1	79.23	
082.0	000.0060	0300.4	008.8	002.2	000.0123	0210.3	002.0	80.56	

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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)
083.0	000.0060	0301.7	008.8	003.5	000.0139	0211.7	001.8	81.87
084.0	000.0060	0298.0	008.8	002.7	000.0129	0210.5	001.7	82.40
085.0	000.0060	0290.9	008.7	359.7	000.0097	0214.7	001.5	82.10
086.0	000.0060	0284.1	008.6	355.8	000.0063	0215.2	001.4	82.17
087.0	000.0060	0277.3	008.5	350.8	000.0029	0230.4	001.2	79.80
088.0	000.0060	0279.3	008.5	351.5	000.0033	0230.7	001.1	81.50
089.0	000.0060	0285.5	008.6	356.3	000.0067	0214.2	000.9	85.90
090.0	000.0060	0291.5	008.7	002.5	000.0127	0210.3	000.8	90.25
091.0	000.0060	0297.4	008.8	010.9	000.0238	0275.9	000.6	94.79
092.0	000.0060	0298.0	008.8	014.8	000.0303	0282.4	000.5	98.20
093.0	000.0060	0289.3	008.7	357.8	000.0079	0217.0	000.3	95.99
094.0	000.0060	0280.8	008.5	318.3	000.0009	0094.3	000.2	89.04
095.0	000.0060	0272.5	008.4	276.6	000.0025	0036.8	000.3	91.42
096.0	000.0060	0265.0	008.3	257.0	000.0025	0072.9	000.4	87.99
097.0	000.0060	0262.7	008.2	243.9	000.0025	0085.2	000.5	86.24
098.0	000.0060	0263.8	008.3	231.7	000.0025	0110.6	000.6	85.07
099.0	000.0060	0267.0	008.3	220.5	000.0095	0146.4	000.7	89.76
100.0	000.0060	0272.3	008.4	209.7	000.0100	0129.8	000.8	88.88
101.0	000.0060	0275.6	008.5	203.6	000.0100	0130.5	000.9	87.60
102.0	000.0060	0276.8	008.5	201.0	000.0100	0137.4	001.1	86.36
103.0	000.0060	0277.5	008.5	199.4	000.0100	0144.5	001.2	85.25
104.0	000.0060	0277.0	008.5	199.1	000.0100	0146.1	001.4	84.25
105.0	000.0060	0276.9	008.5	198.7	000.0100	0148.1	001.5	81.71
106.0	000.0060	0277.5	008.5	198.1	000.0100	0151.7	001.7	80.82
107.0	000.0060	0278.3	008.5	197.6	000.0100	0154.5	001.8	79.94
108.0	000.0060	0280.6	008.5	196.5	000.0100	0159.2	002.0	79.14
109.0	000.0060	0280.5	008.5	196.7	000.0100	0158.3	002.1	78.25
110.0	000.0060	0277.4	008.5	198.1	000.0100	0151.4	002.2	77.22
111.0	000.0060	0273.0	008.4	200.0	000.0100	0141.8	002.4	76.08
112.0	000.0060	0269.6	008.4	201.3	000.0100	0135.7	002.5	75.04
113.0	000.0060	0268.5	008.3	201.8	000.0100	0133.5	002.7	74.16
114.0	000.0060	0269.5	008.4	201.5	000.0100	0134.6	002.8	73.43
115.0	000.0060	0271.8	008.4	200.9	000.0100	0137.5	003.0	72.81
116.0	000.0060	0273.9	008.4	200.6	000.0100	0139.1	003.1	72.19
117.0	000.0060	0274.9	008.4	200.5	000.0100	0139.2	003.3	71.55
118.0	000.0060	0275.5	008.5	200.7	000.0100	0138.5	003.4	70.89
119.0	000.0060	0277.1	008.5	200.6	000.0100	0138.9	003.6	70.29
120.0	000.0060	0280.8	008.5	200.1	000.0100	0141.4	003.7	69.79
121.0	000.0060	0285.3	008.6	199.5	000.0100	0144.4	003.9	69.31
122.0	000.0060	0289.4	008.7	199.0	000.0100	0146.4	004.0	68.82
123.0	000.0060	0291.4	008.7	199.1	000.0100	0146.0	004.2	68.24
124.0	000.0060	0290.3	008.7	199.8	000.0100	0142.5	004.3	67.55
125.0	000.0060	0288.1	008.7	200.7	000.0100	0138.3	004.5	66.85
126.0	000.0060	0287.0	008.6	201.4	000.0100	0135.1	004.6	66.20

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

FMCommander Single Allocation Study - 03-14-2017 - FCC NGDC 30 Sec
W262CL.P's Overlaps (In= 2.03 km, Out= 9.69 km)

W262CL.P CH 262 D DA
Lat= 42 50 47.0, Lng= 72 41 17.0
0.25 kW 225.7 m HAAT, 594 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

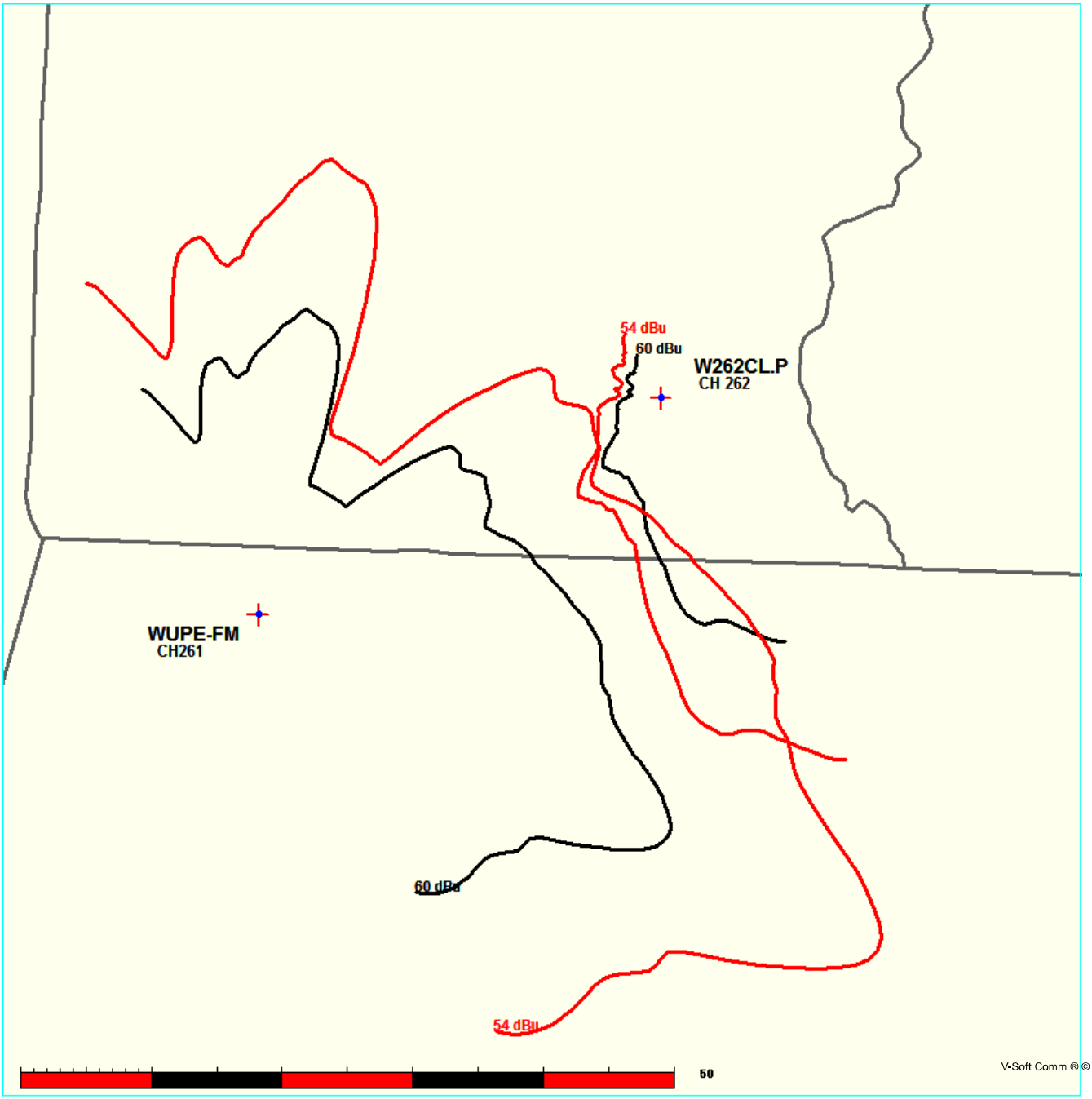

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Exhibit 7c
Contour Protection Studies Toward Select Allocation Concern(s)

03-14-2017 Terrain Data: FCC NGDC 30 Sec FMOver Analysis

W262CL.P	WUPE-FM BLH20151014ABU
Channel = 262D	Channel = 261A
Max ERP = 0.25 kW	Max ERP = 1.15 kW
RCAMSL = 594 m	RCAMSL = 677.3 m
N. Lat. 42 50 47.0	N. Lat. 42 41 54.0
W. Lng. 72 41 17.0	W. Lng. 73 03 54.0
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)
200.0	000.2500	0141.7	015.4	085.4	001.1500	0148.6	025.6	59.29*	9.10
201.0	000.2500	0137.2	015.1	084.5	001.1500	0144.3	025.5	59.10*	8.71
202.0	000.2500	0132.4	014.8	083.7	001.1500	0140.3	025.4	58.90*	8.32
203.0	000.2500	0130.4	014.7	083.2	001.1500	0138.8	025.2	58.92*	8.30
204.0	000.2500	0131.2	014.7	083.0	001.1500	0138.3	025.0	59.06*	8.49
205.0	000.2500	0133.6	014.9	082.9	001.1500	0138.2	024.7	59.26*	8.78
206.0	000.2500	0134.3	014.9	082.7	001.1500	0137.7	024.5	59.40*	8.94
207.0	000.2500	0132.4	014.8	082.1	001.1500	0136.1	024.3	59.40*	8.90
208.0	000.2500	0129.8	014.6	081.5	001.1500	0133.5	024.2	59.32*	8.70
209.0	000.2500	0129.0	014.6	081.0	001.1500	0131.6	024.0	59.32*	8.63
210.0	000.2500	0130.1	014.7	080.8	001.1500	0130.5	023.8	59.42*	8.73
211.0	000.2500	0131.4	014.7	080.5	001.1500	0129.3	023.5	59.52*	8.82
212.0	000.2500	0133.1	014.8	080.3	001.1500	0128.2	023.3	59.64*	8.95
213.0	000.2500	0135.2	015.0	080.1	001.1500	0127.4	023.0	59.79*	9.12
214.0	000.2500	0136.6	015.0	079.8	001.1500	0126.3	022.7	59.90*	9.23
215.0	000.2500	0137.2	015.1	079.4	001.1500	0125.0	022.5	59.98*	9.29
216.0	000.2500	0137.9	015.1	079.0	001.1500	0124.3	022.3	60.09*	9.41
217.0	000.2500	0139.3	015.2	078.7	001.1500	0123.9	022.1	60.25*	9.60
218.0	000.2500	0141.2	015.3	078.3	001.1500	0123.4	021.8	60.42*	9.81
219.0	000.2500	0143.2	015.5	078.0	001.1500	0122.8	021.5	60.59*	10.00
220.0	000.2500	0145.3	015.6	077.7	001.1500	0121.9	021.2	60.75*	10.17
221.0	000.2500	0147.3	015.7	077.3	001.1500	0120.8	021.0	60.88*	10.30
222.0	000.2500	0148.6	015.8	076.8	001.1500	0119.2	020.8	60.95*	10.32
223.0	000.2500	0149.2	015.8	076.2	001.1500	0117.3	020.6	60.96*	10.27
224.0	000.2500	0148.7	015.8	075.5	001.1500	0115.3	020.4	60.90*	10.12
225.0	000.2500	0146.7	015.7	074.7	001.1500	0112.9	020.4	60.75*	9.83
226.0	000.2500	0142.9	015.4	073.7	001.1500	0109.1	020.5	60.38*	9.21
227.0	000.2500	0137.4	015.1	072.6	001.1500	0104.2	020.7	59.82*	8.31
228.0	000.2500	0131.0	014.7	071.5	001.1500	0099.6	020.9	59.21*	7.37
229.0	000.2500	0124.8	014.3	070.5	001.1500	0096.5	021.2	58.73*	6.65
230.0	000.2500	0118.8	014.0	069.5	001.1500	0094.2	021.4	58.33*	6.07
231.0	000.2500	0113.6	013.7	068.7	001.1500	0093.0	021.6	58.05*	5.67
232.0	000.2500	0109.8	013.5	067.9	001.1500	0094.1	021.8	58.04*	5.69

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Exhibit 7c

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)	
233.0	000.2500	0107.9	013.4	067.2	001.1500	0095.9	021.8	58.17*	5.92
234.0	000.2500	0107.0	013.3	066.6	001.1500	0097.6	021.8	58.34*	6.18
235.0	000.2500	0106.5	013.3	066.0	001.1500	0099.1	021.8	58.50*	6.43
236.0	000.2500	0105.2	013.2	065.3	001.1500	0101.0	021.8	58.65*	6.69
237.0	000.2500	0103.0	013.1	064.7	001.1500	0102.6	021.9	58.71*	6.83
238.0	000.2500	0099.8	012.8	064.0	001.1500	0103.7	022.1	58.68*	6.82
239.0	000.2500	0096.0	012.6	063.4	001.1500	0104.0	022.3	58.54*	6.65
240.0	000.2500	0092.5	012.4	062.8	001.1500	0104.2	022.5	58.41*	6.48
241.0	000.2500	0089.8	012.2	062.2	001.1500	0104.4	022.7	58.30*	6.34
242.0	000.2500	0087.7	012.1	061.7	001.1500	0104.7	022.8	58.22*	6.24
243.0	000.2500	0086.2	012.0	061.2	001.1500	0105.2	022.9	58.19*	6.23
244.0	000.2500	0085.0	011.9	060.7	001.1500	0106.1	023.0	58.21*	6.27
245.0	000.2500	0084.1	011.8	060.2	001.1500	0106.9	023.1	58.22*	6.32
246.0	000.2500	0083.3	011.8	059.7	001.1500	0107.8	023.1	58.24*	6.37
247.0	000.2500	0082.5	011.7	059.2	001.1500	0108.4	023.2	58.23*	6.37
248.0	000.2500	0081.2	011.7	058.7	001.1500	0108.2	023.3	58.14*	6.25
249.0	000.2500	0080.2	011.6	058.3	001.1500	0107.7	023.4	58.02*	6.06
250.0	000.2500	0079.3	011.5	057.8	001.1500	0106.7	023.5	57.86*	5.82
251.0	000.2500	0077.9	011.4	057.4	001.1500	0105.4	023.7	57.65*	5.50
252.0	000.2500	0075.9	011.3	057.0	001.1500	0104.1	023.8	57.40*	5.12
253.0	000.2500	0073.4	011.1	056.6	001.1500	0103.0	024.1	57.15*	4.74
254.0	000.2500	0071.9	011.0	056.3	001.1500	0101.8	024.2	56.93*	4.41
255.0	000.2500	0071.9	011.0	055.8	001.1500	0100.4	024.3	56.75*	4.13
256.0	000.2500	0072.9	011.1	055.4	001.1500	0098.7	024.3	56.60*	3.88
257.0	000.2500	0072.9	011.1	054.9	001.1500	0097.9	024.3	56.47*	3.68
258.0	000.2500	0072.3	011.1	054.6	001.1500	0097.6	024.5	56.36*	3.53
259.0	000.2500	0070.2	010.9	054.3	001.1500	0097.5	024.7	56.20*	3.30
260.0	000.2500	0067.9	010.7	054.0	001.1500	0097.6	024.9	56.05*	3.09
261.0	000.2500	0064.8	010.5	053.9	001.1500	0097.9	025.2	55.88*	2.85
262.0	000.2500	0059.9	010.2	053.9	001.1500	0097.9	025.6	55.61*	2.45
263.0	000.2500	0055.3	009.8	054.0	001.1500	0097.8	026.0	55.31*	2.02
264.0	000.2500	0052.4	009.5	053.9	001.1500	0097.8	026.3	55.10*	1.70
265.0	000.2500	0049.2	009.2	054.0	001.1500	0097.7	026.7	54.84*	1.32
266.0	000.2500	0044.8	008.7	054.2	001.1500	0097.5	027.2	54.51*	0.81
267.0	000.2500	0040.4	008.2	054.5	001.1500	0097.6	027.7	54.19*	0.31
268.0	000.2500	0037.1	007.8	054.7	001.1500	0097.7	028.1	53.96	
269.0	000.2500	0034.5	007.6	054.8	001.1500	0097.8	028.4	53.78	
270.0	000.2500	0032.0	007.3	054.9	001.1500	0097.8	028.7	53.61	
271.0	000.2500	0029.4	007.1	054.9	001.1500	0097.8	028.9	53.47	
272.0	000.2500	0027.9	007.1	054.7	001.1500	0097.7	029.0	53.41	
273.0	000.2500	0028.8	007.1	054.5	001.1500	0097.6	029.0	53.36	
274.0	000.2500	0031.0	007.2	054.2	001.1500	0097.6	029.0	53.36	
275.0	000.2500	0033.3	007.4	053.7	001.1500	0098.2	028.9	53.47	
276.0	000.2500	0035.8	007.7	053.1	001.1500	0099.2	028.8	53.64	
277.0	000.2500	0037.5	007.9	052.7	001.1500	0100.2	028.8	53.75	

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

03-14-2017 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 = 594 m
N. Lat. 42 41 54.0	N. Lat. 42 50 47.0
W. Lng. 73 03 54.0	W. Lng. 72 41 17.0
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)
017.0	001.1500	0116.1	020.8	278.0	000.0025	0038.7	024.9	21.26	
018.0	001.1500	0099.8	019.3	274.4	000.0025	0032.0	024.8	19.72	
019.0	001.1500	0079.2	016.9	269.1	000.0025	0034.3	025.2	20.03	
020.0	001.1500	0056.3	014.2	263.3	000.0025	0054.4	026.1	23.50	
021.0	001.1500	0032.4	010.9	256.9	000.0025	0073.0	027.6	24.95	
022.0	001.1500	0007.0	010.5	256.0	000.0025	0072.9	027.6	24.91	
023.0	001.1500	-0018.7	010.5	255.8	000.0025	0072.8	027.5	24.99	
024.0	001.1500	-0040.3	010.5	255.6	000.0025	0072.6	027.3	25.05	
025.0	001.1500	-0054.1	010.5	255.3	000.0025	0072.3	027.2	25.12	
026.0	001.1500	-0060.5	010.5	255.1	000.0025	0072.0	027.1	25.17	
027.0	001.1500	-0061.1	010.5	254.8	000.0025	0071.7	026.9	25.22	
028.0	001.1500	-0054.7	010.5	254.6	000.0025	0071.6	026.8	25.29	
029.0	001.1500	-0043.3	010.5	254.3	000.0025	0071.6	026.7	25.38	
030.0	001.1500	-0031.6	010.5	254.0	000.0025	0071.9	026.5	25.50	
031.0	001.1500	-0021.6	010.5	253.7	000.0025	0072.2	026.4	25.62	
032.0	001.1500	-0014.5	010.5	253.4	000.0025	0072.6	026.3	25.75	
033.0	001.1500	-0011.1	010.5	253.1	000.0025	0073.2	026.2	25.90	
034.0	001.1500	-0010.8	010.5	252.8	000.0025	0073.9	026.0	26.06	
035.0	001.1500	-0009.6	010.5	252.5	000.0025	0074.7	025.9	26.23	
036.0	001.1500	-0004.8	010.5	252.2	000.0025	0075.5	025.8	26.40	
037.0	001.1500	0004.1	010.5	251.8	000.0025	0076.3	025.7	26.57	
038.0	001.1500	0014.9	010.5	251.5	000.0025	0077.0	025.6	26.73	
039.0	001.1500	0024.9	010.5	251.1	000.0025	0077.7	025.5	26.87	
040.0	001.1500	0032.9	010.9	251.3	000.0025	0077.4	025.1	27.16	
041.0	001.1500	0039.9	012.0	252.1	000.0025	0075.6	024.1	27.65	
042.0	001.1500	0047.0	013.0	252.9	000.0025	0073.6	023.1	28.15	
043.0	001.1500	0055.0	014.1	253.8	000.0025	0072.1	022.0	28.78	
044.0	001.1500	0062.6	014.9	254.4	000.0025	0071.6	021.2	29.42	
045.0	001.1500	0069.6	015.8	254.9	000.0025	0071.8	020.3	30.11	
046.0	001.1500	0077.4	016.7	255.5	000.0025	0072.5	019.3	31.00	
047.0	001.1500	0085.8	017.7	256.2	000.0025	0073.0	018.3	31.91	
048.0	001.1500	0093.6	018.6	256.7	000.0025	0073.0	017.4	32.70	
049.0	001.1500	0099.7	019.2	256.7	000.0025	0073.0	016.7	33.32	

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Exhibit 7c

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)
050.0	001.1500	0102.2	019.5	256.1	000.0025	0072.9	016.3	33.64
051.0	001.1500	0103.0	019.6	255.1	000.0025	0072.0	016.1	33.72
052.0	001.1500	0101.9	019.5	253.8	000.0025	0072.1	016.0	33.76
053.0	001.1500	0099.5	019.2	252.4	000.0025	0074.9	016.2	33.98
054.0	001.1500	0097.7	019.0	251.0	000.0025	0077.8	016.2	34.24
055.0	001.1500	0097.9	019.1	249.9	000.0025	0079.3	016.1	34.50
056.0	001.1500	0100.9	019.4	249.0	000.0025	0080.2	015.7	34.92
057.0	001.1500	0104.1	019.7	248.0	000.0025	0081.2	015.3	35.37
058.0	001.1500	0107.1	020.0	246.9	000.0025	0082.5	015.0	35.81
059.0	001.1500	0108.4	020.1	245.7	000.0025	0083.5	014.8	35.92
060.0	001.1500	0107.2	020.0	244.3	000.0025	0084.7	014.9	35.96
061.0	001.1500	0105.5	019.8	242.9	000.0025	0086.3	015.1	36.14
062.0	001.1500	0104.5	019.7	241.6	000.0025	0088.5	015.2	36.28
063.0	001.1500	0104.2	019.7	240.3	000.0025	0091.6	015.2	36.54
064.0	001.1500	0103.7	019.7	239.0	000.0025	0095.8	015.3	36.89
065.0	001.1500	0101.9	019.5	237.9	000.0025	0100.3	015.5	37.11
066.0	001.1500	0099.0	019.2	236.8	000.0025	0103.6	015.8	37.10
067.0	001.1500	0096.4	018.9	235.8	000.0025	0105.6	016.2	36.99
068.0	001.1500	0093.8	018.6	234.9	000.0025	0106.6	016.5	36.79
069.0	001.1500	0093.2	018.6	233.9	000.0025	0107.0	016.7	36.70
070.0	001.1500	0095.3	018.8	232.6	000.0025	0108.4	016.5	36.93
071.0	001.1500	0097.9	019.1	231.2	000.0025	0112.9	016.4	37.41
072.0	001.1500	0101.6	019.4	229.6	000.0027	0121.4	016.1	38.59
073.0	001.1500	0106.2	019.9	227.8	000.0037	0132.4	015.9	40.91
074.0	001.1500	0110.4	020.3	226.0	000.0049	0143.0	015.7	42.97
075.0	001.1500	0113.8	020.6	224.3	000.0062	0148.2	015.6	44.37
076.0	001.1500	0116.6	020.8	222.7	000.0075	0149.1	015.6	45.27
077.0	001.1500	0119.9	021.1	221.0	000.0090	0147.4	015.6	45.96
078.0	001.1500	0122.8	021.3	219.5	000.0100	0144.3	015.6	46.18
079.0	001.1500	0124.3	021.4	218.2	000.0100	0141.5	015.8	45.88
080.0	001.1500	0127.0	021.6	216.7	000.0100	0138.6	015.9	45.60
081.0	001.1500	0131.5	022.0	214.8	000.0100	0137.0	015.9	45.47
082.0	001.1500	0135.6	022.3	213.1	000.0100	0135.3	016.0	45.29
083.0	001.1500	0138.4	022.5	211.6	000.0100	0132.4	016.2	44.95
084.0	001.1500	0141.5	022.7	210.1	000.0100	0130.4	016.3	44.67
085.0	001.1500	0146.8	023.1	208.3	000.0100	0129.3	016.4	44.51
086.0	001.1500	0151.5	023.4	206.5	000.0100	0133.5	016.6	44.64
087.0	001.1500	0155.7	023.7	205.0	000.0100	0133.5	016.8	44.46
088.0	001.1500	0159.7	024.0	203.5	000.0100	0130.4	017.1	44.05
089.0	001.1500	0166.0	024.4	201.7	000.0100	0133.9	017.3	44.10
090.0	001.1500	0171.7	024.8	200.0	000.0100	0141.6	017.6	44.39
091.0	001.1500	0176.8	025.1	198.6	000.0100	0148.7	017.9	44.60
092.0	001.1500	0181.8	025.4	197.3	000.0100	0155.8	018.2	44.76
093.0	001.1500	0187.7	025.8	195.9	000.0100	0162.4	018.6	44.88

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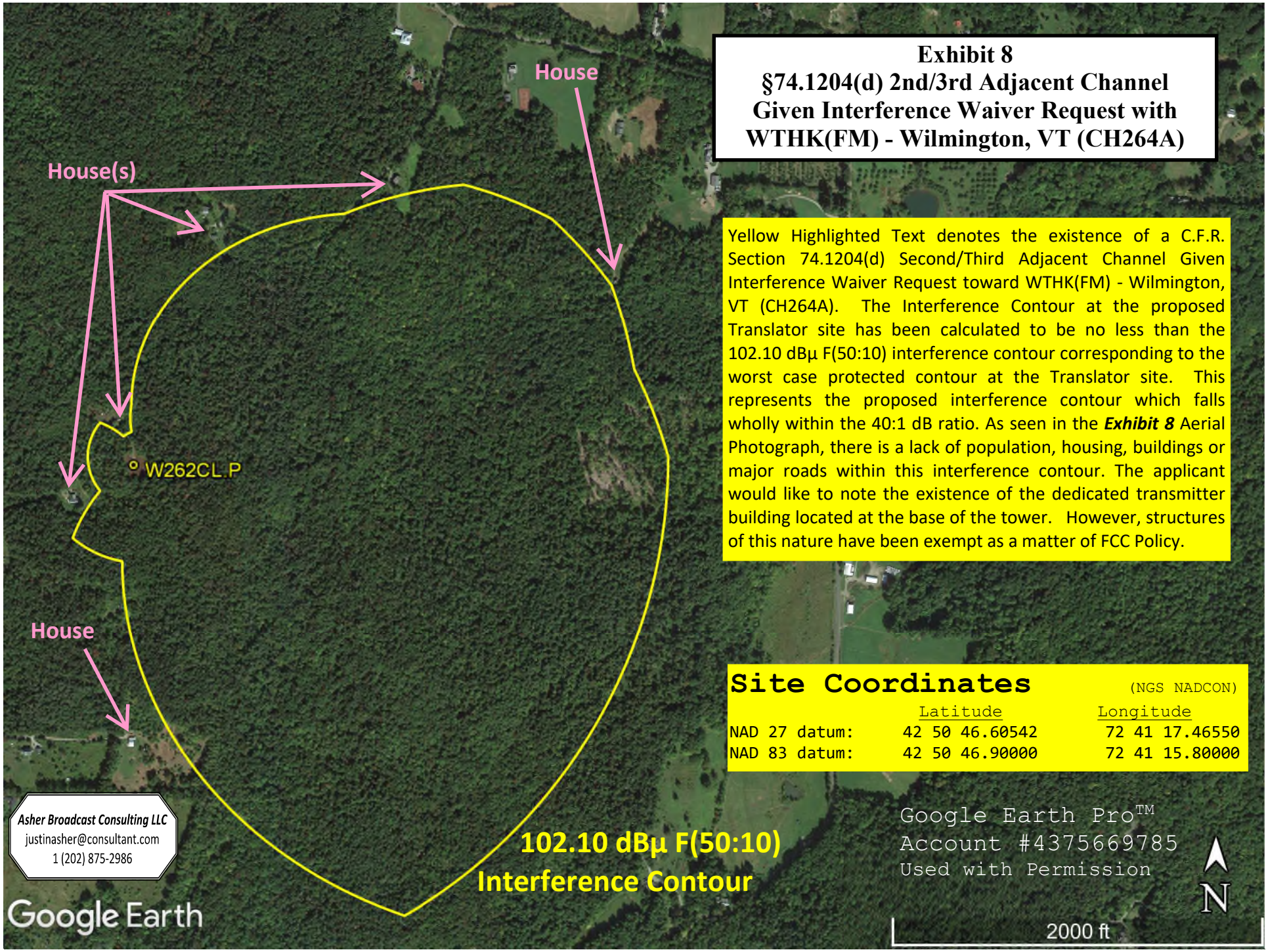


Exhibit 8
§74.1204(d) 2nd/3rd Adjacent Channel Given Interference Waiver Request with WTHK(FM) - Wilmington, VT (CH264A)

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 102.10 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.

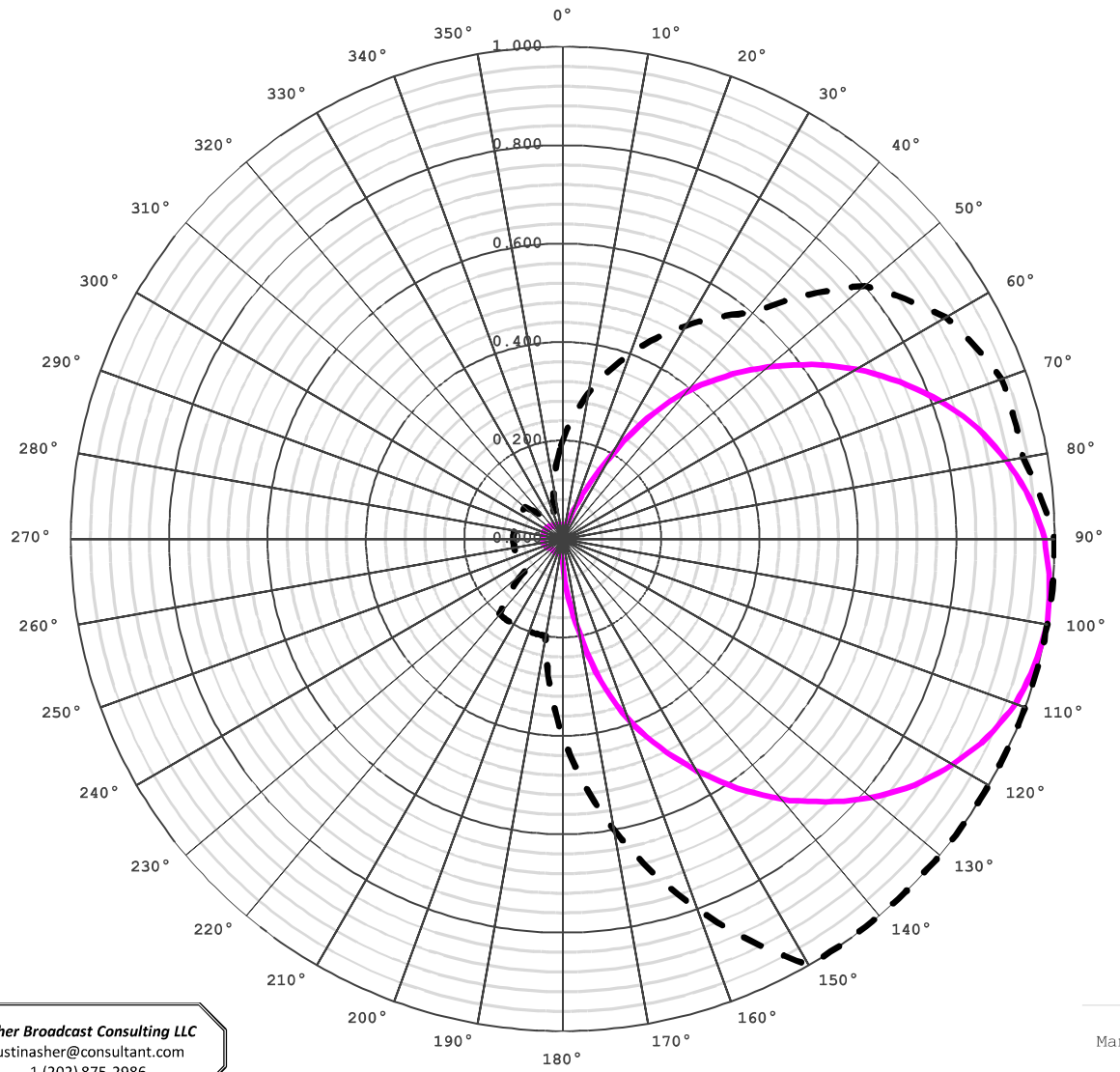
Site Coordinates (NGS NADCON)

	Latitude	Longitude
NAD 27 datum:	42 50 46.60542	72 41 17.46550
NAD 83 datum:	42 50 46.90000	72 41 15.80000

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

Manufacturer's	Make/Model	Orientation	Power
Element 1:	CI-FM(Slant45)	100° True	100.0%
Element 2:			
Element 3:			
Element 4:			

Composite Power: 100%



Azimuth ° True	FCC Pattern	Manufacturer's Pattern
0°	0.200	0.030
10°	0.300	0.030
20°	0.400	0.050
30°	0.500	0.190
40°	0.600	0.390
50°	0.800	0.544
60°	0.900	0.690
70°	0.950	0.817
80°	0.950	0.916
90°	1.000	0.980
100°	1.000	1.000
110°	1.000	0.980
120°	1.000	0.916
130°	1.000	0.817
140°	1.000	0.690
150°	1.000	0.544
160°	0.800	0.390
170°	0.600	0.190
180°	0.400	0.050
190°	0.200	0.030
200°	0.200	0.030
210°	0.200	0.030
220°	0.200	0.030
230°	0.100	0.030
240°	0.100	0.034
250°	0.100	0.038
260°	0.100	0.040
270°	0.100	0.040
280°	0.100	0.040
290°	0.100	0.040
300°	0.100	0.040
310°	0.100	0.038
320°	0.050	0.034
330°	0.050	0.030
340°	0.050	0.030
350°	0.100	0.030

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

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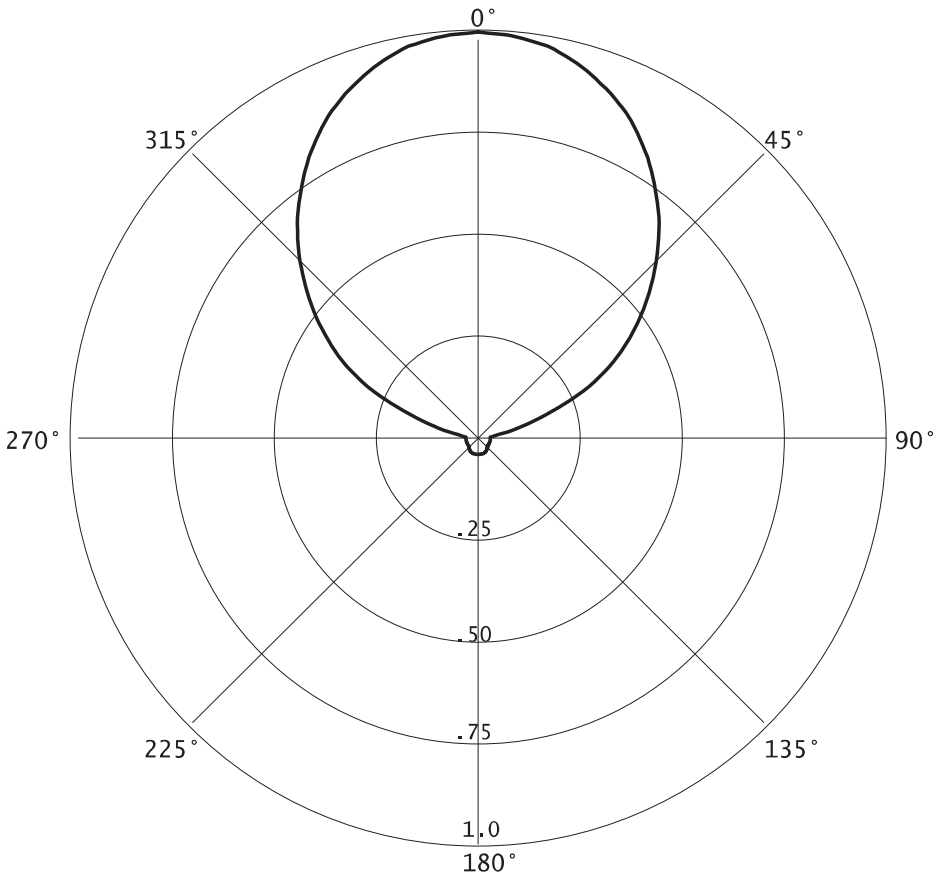
Exhibit 9
Copy of Manufacturer's Directional Antenna Documentation
(Actual Antenna Pattern rotated to 100.0°T) *(public record copy)*

CL-FM(Slant-45)
COMPOSITE PATTERN

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

RMS(V)= .468

Graph is Relative Field



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 100.0°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.

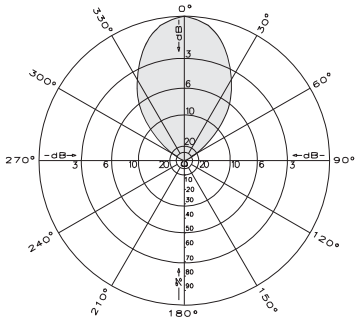
Like all Kathrein Scala Division antennas, the CL-FM is made of the finest materials using state of the art electrical and mechanical designs, resulting in superior performance and long service life.

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

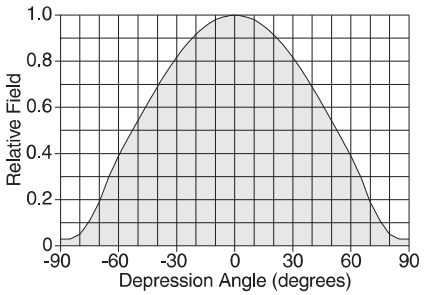
Specifications:

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

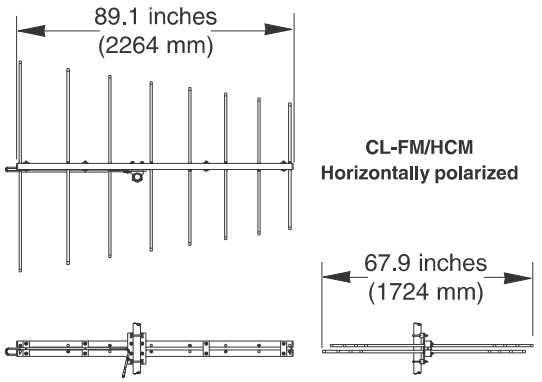
Exhibit 9
Copy of Manufacturer's Directional Antenna Documentation
(Actual Antenna Pattern rotated to 100.0°T) ***(public record copy)***

CL-FM

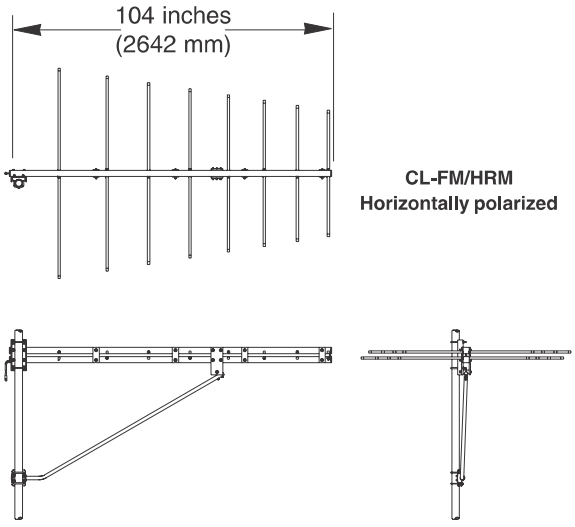
FM LOG-PERIODIC ANTENNA

7 dBd gain

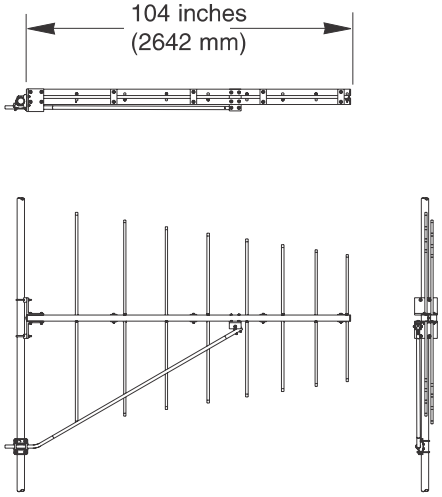
88–108 MHz



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

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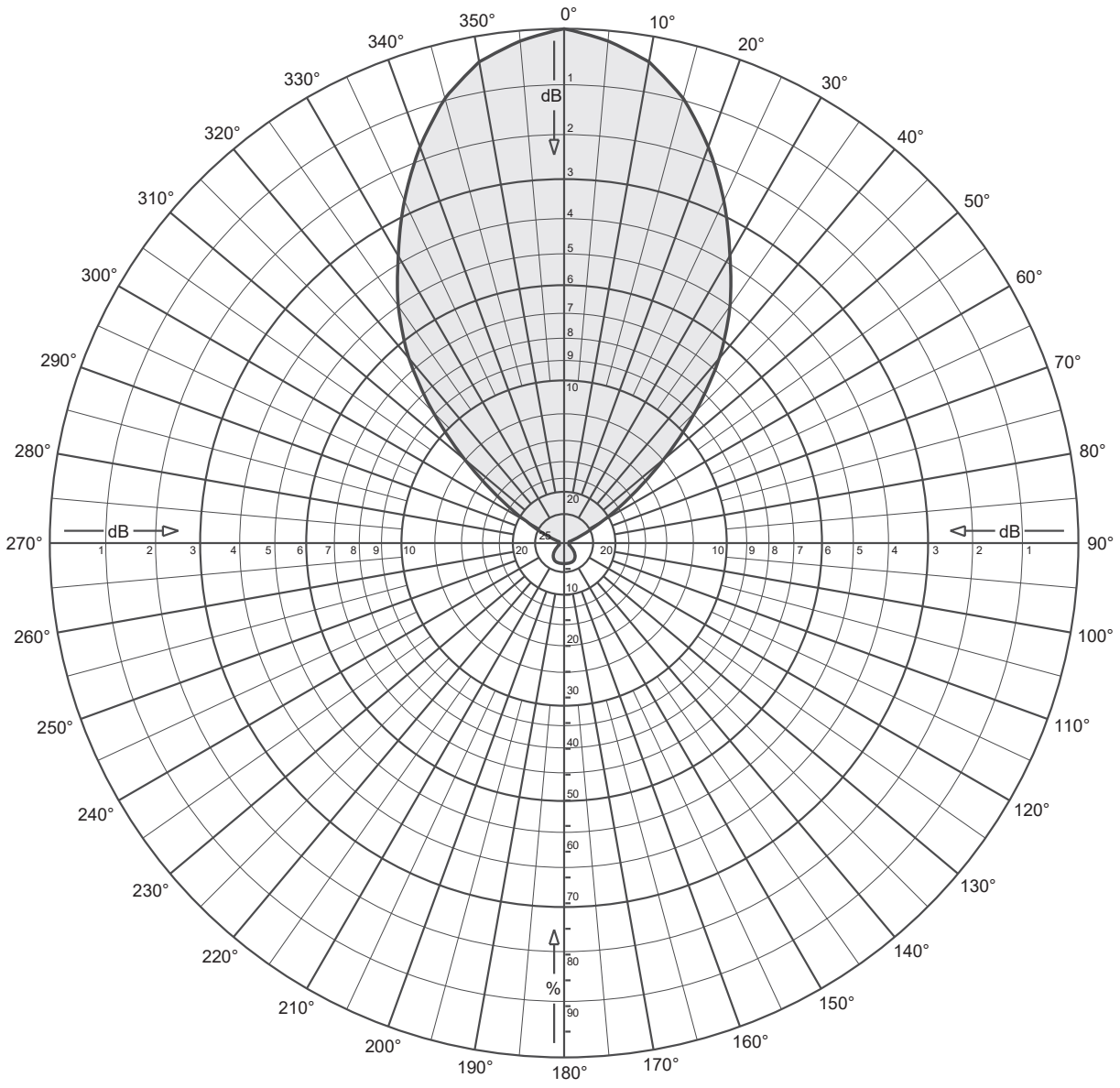
Email: broadcast@kathrein.com Internet: www.kathrein-scala.com

Exhibit 9
Copy of Manufacturer's Directional Antenna Documentation
(Actual Antenna Pattern rotated to 100.0°T) *(public record copy)*



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

KATHREIN
SCALA DIVISION
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http://www.kathrein-scala.com

26-Oct-2011

Exhibit 9
Copy of Manufacturer's Directional Antenna Documentation
(Actual Antenna Pattern rotated to 100.0°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 100.0°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 100.0°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 100.0°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

Exhibit 9
Copy of Manufacturer's Directional Antenna Documentation
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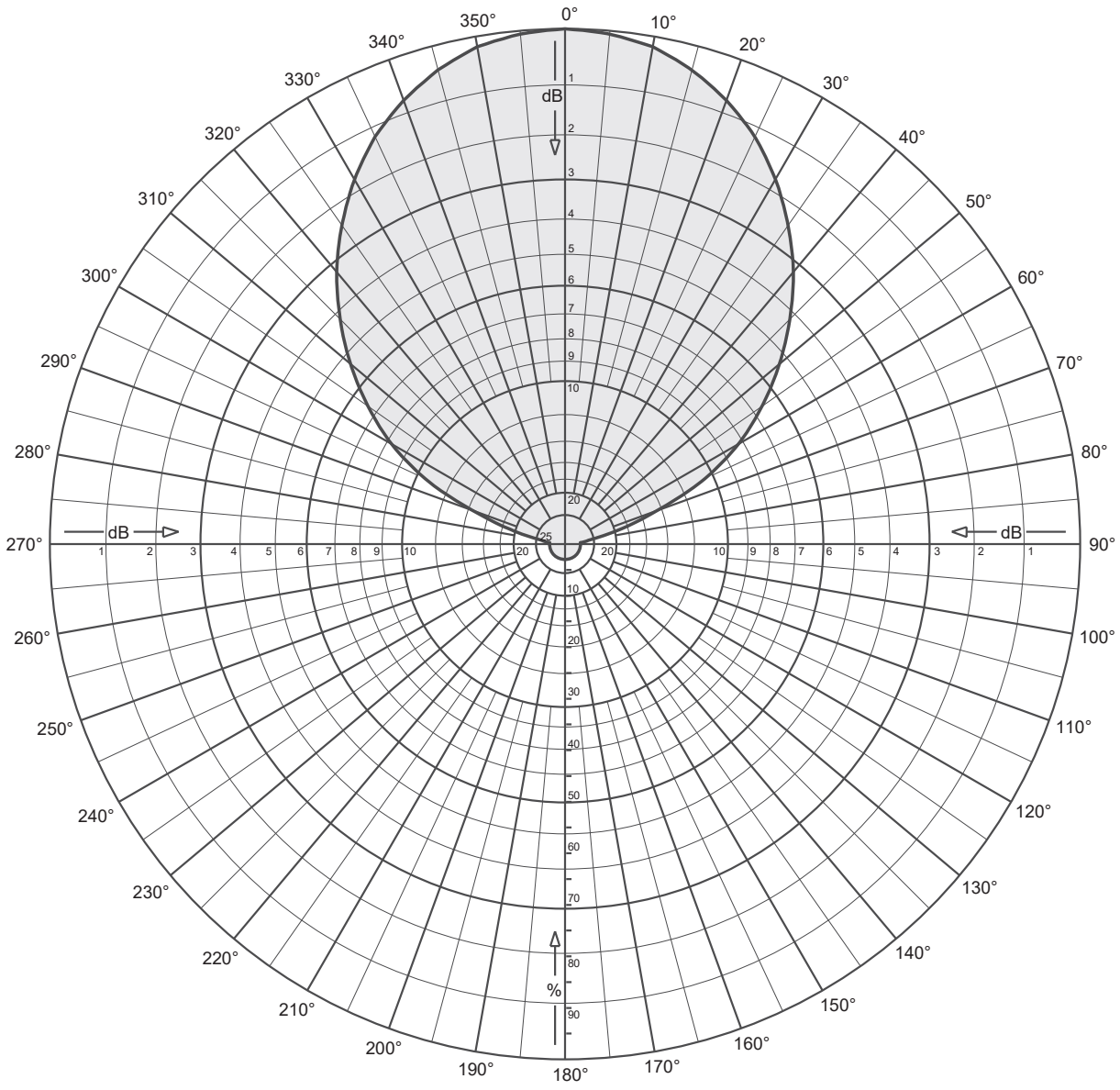

CL-FM
FM
Maximum gain: 7.0 dBd
Vertical polarization Component
Horizontal radiation pattern
0 degree electrical downtilt

KATHREIN
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Post Office Box 4580
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26-Oct-2011

Exhibit 9
Copy of Manufacturer's Directional Antenna Documentation
(Actual Antenna Pattern rotated to 100.0°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
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 100.0°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 100.0°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 100.0°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