

Consolidated Engineering Exhibits

North Country Educational Radio (“NCER”) proposes a new class A NCE station serving Littleton NH. Operation is proposed on channel 207 at 115 meters HAAT¹ using four-bay circularly-polarized directional antenna whose radiation center is 54 meters above the ground.

The proposed ERP is 4.6 kW, reduced from the reference ERP because 115 meters is greater than the class A reference HAAT of 100 meters. The resulting reference contour of 28.4 km is consistent with class A according to 73.211.

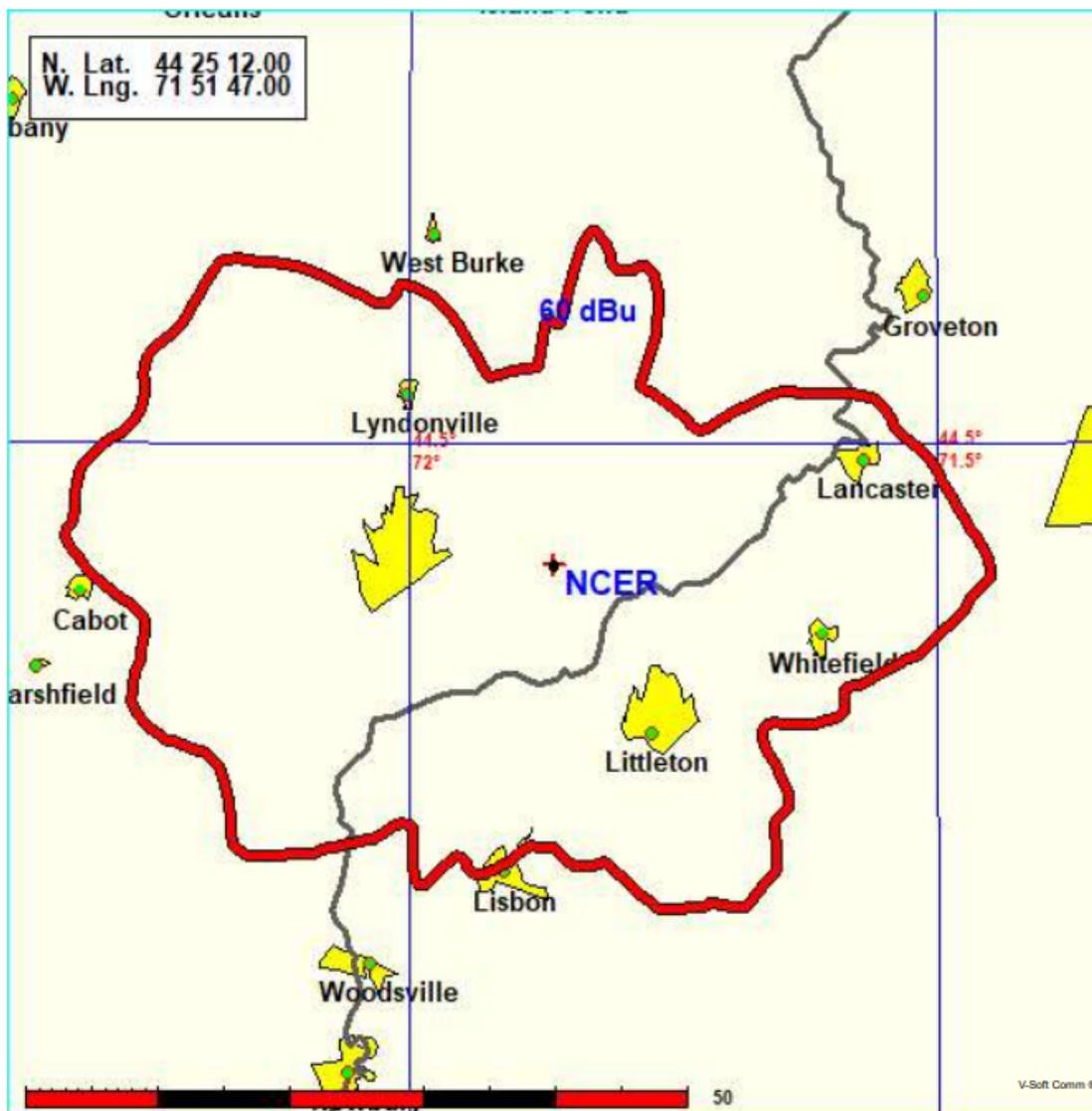
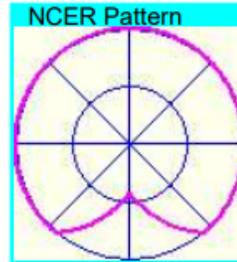
¹ All HAAT calculations utilize the FCC-30 aka NGDC-30 terrain database in a manner consistent with the FCC HAAT calculator web page, also known as “HAAT method 0” in V-Soft FMCommander.

Proposed city of license, Littleton NH, is entirely encompassed by the 2236 square kilometer service contour as shown in the map below, meeting the requirements of 73.515. 44,006 people live within the service contour².

NCER Service Contour

Coverage Study - NGDC 30 SEC
11-08-2021

NCER CH207 A , 4.6 kW, 114.0m HAAT, 469.0m COR AMSL
Service Contour = 60 dBu.



² Census 2010 block data, centroid method.

V-Soft Communications Population Report

Transmitter Information:

Call Letters: NCER
Latitude: 44-25-12 N
Longitude: 071-51-47 W
ERP: 4.60 kW
Channel: 207
Frequency: 89.3 MHz
AMSL Height: 469.03 m
Elevation: 415.03 m
Horiz. Antenna Pattern: Directional
Vert. Elevation Pattern: No
Propagation Model: FCC Model
Location Variability: 50.0%
Time Variability: 50.0%
HAAT Method: FCC

Population Database: 2010 US Census (PL)

Primary Terrain: V-Soft 30 Second US Database

Population report for field strength greater than 60.0 dBuV/m.

Total Population covered by NCER: 44,006
Total Housing Units covered by NCER: 22,923
Total Area covered by NCER: 2236.34 sq. km
Total Area covered by NCER where population exists: 455.55 sq. km

	Housing Units	Population	
New Hampshire			
Coos County			
Total	21,321	33,055	
NCER	3,760	7,080	
	White:	6,777	[95.7%]
	Black:	25	[0.4%]
	Hispanic:	120	[1.7%]
	Native American:	33	[0.5%]
	Asian:	45	[0.6%]
	Pacific Islander:	1	[0.0%]
	Mixed Race:	73	[1.0%]
	Other:	6	[0.1%]

Grafton County			
Total	51,120	89,118	
NCER	6,363	11,386	
	White:	10,900	[95.7%]
	Black:	15	[0.1%]
	Hispanic:	189	[1.7%]
	Native American:	37	[0.3%]
	Asian:	82	[0.7%]
	Pacific Islander:	5	[0.0%]
	Mixed Race:	149	[1.3%]
	Other:	9	[0.1%]
Vermont			
Caledonia County			
Total	15,942	31,227	
NCER	10,760	22,328	
	White:	21,322	[95.5%]
	Black:	126	[0.6%]
	Hispanic:	255	[1.1%]
	Native American:	96	[0.4%]
	Asian:	233	[1.0%]
	Pacific Islander:	1	[0.0%]
	Mixed Race:	264	[1.2%]
	Other:	31	[0.1%]
Essex County			
Total	5,019	6,306	
NCER	1,711	2,651	
	White:	2,554	[96.3%]
	Black:	5	[0.2%]
	Hispanic:	27	[1.0%]
	Native American:	16	[0.6%]
	Asian:	9	[0.3%]
	Pacific Islander:	0	[0.0%]
	Mixed Race:	40	[1.5%]
	Other:	0	[0.0%]

73.507, 73.207

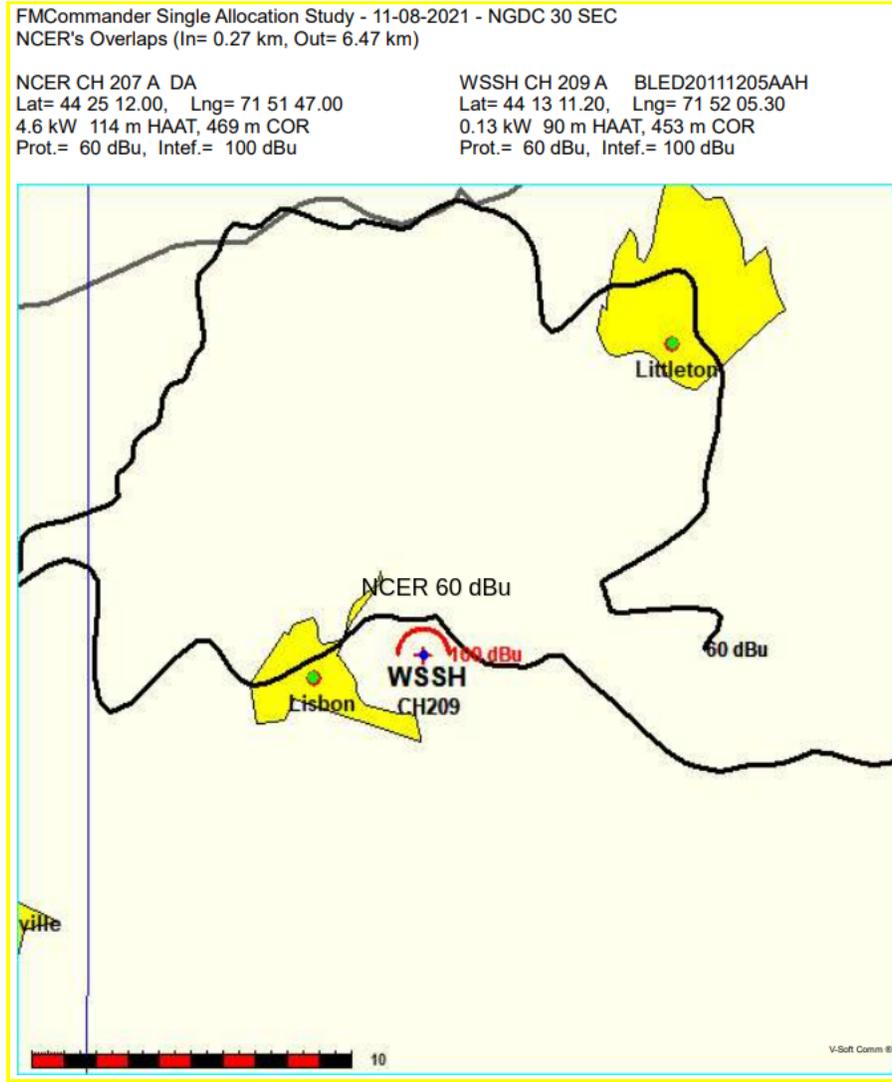
Adjacencies with the non-reserved band are governed by 73.207. WBTZ is the closest IF-adjacent station at 144 km which satisfies 73.207.

73.525

The nearest full-service channel 6 TV station is WRGB, 264 km from the proposed antenna thus in compliance with 73.525.

Contour Overlap 73.509

Prohibited contour overlap is absent in the instant proposal as shown in the channel study excerpt below. The following map demonstrates the contours resulting from a directional antenna which is necessary to protect second-adjacent WSSH.



NCER Channel Study

REFERENCE	CH# 207A - 89.3 MHz, Pwr= 4.6 kW DA, HAAT= 114.0 M, COR= 469 M	DISPLAY DATES
44 25 12.0 N.	Average Protected F(50-50)= 28.3 km	DATA 10-21-21
71 51 47.0 W.	Standard Directional	SEARCH 11-08-21

CH	CALL	TYPE	ANT	AZI.	DIST	LAT.	Pwr (kW)	INT (km)	PRO (km)	*IN*	*OUT*
CITY		STATE		<--	FILE #	LANG.	HAAT (M)	COR (M)	LICENSEE	(Overlap in km)	
209A	WSSH	LIC	CN	181.0	22.26	44 13 11.20	0.130	0.8	13.7	0.3	6.5
Lisbon			NH	1.0	BLED20111205AAH	71 52 05.30	90	453	Nostalgia One Public Radio		
207D	W207AX!	LIC	VN	275.9	105.17	44 30 34.20	0.013	10.8	3.4	57.5	4.3
Burlington			VT	95.0	BLFT19980904TE	73 10 57.50	68	155	Family Stations, Inc.		

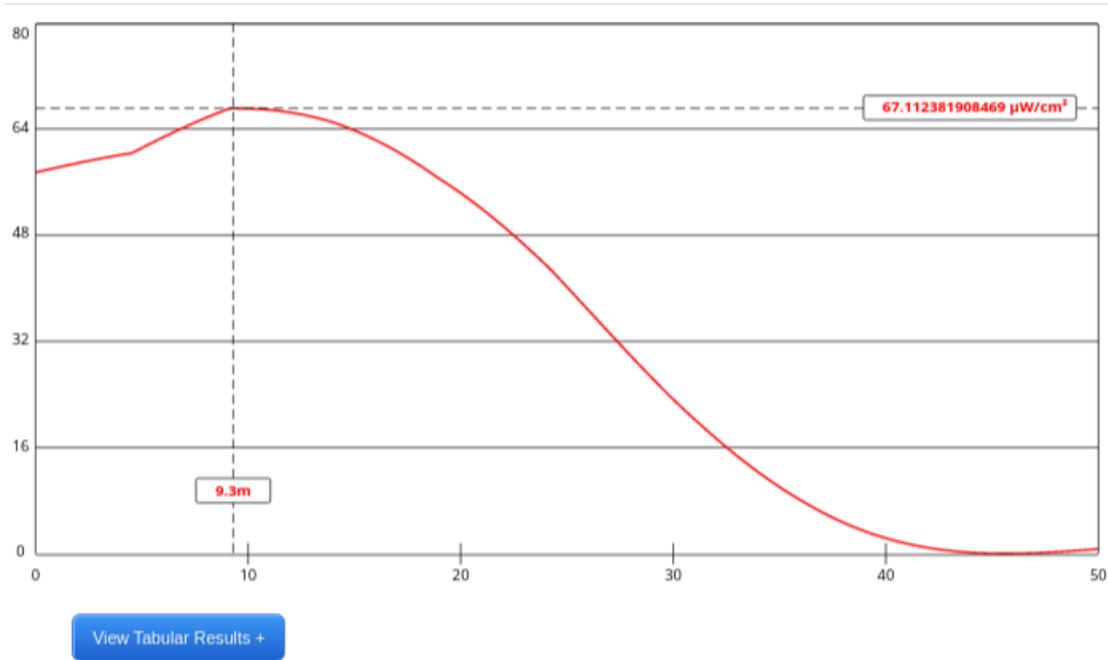
207B WMSJ Freeport	LIC	CN ME	120.2 142.95 301.3 BLED20121016ABG	43 45 45.30 70 19 28.20	14.000 186	110.5 236	41.8 Educational Media Foundati	4.6	21.9
206L1 WYTC-LP Hyde Park	LIC	CN VT	288.6 64.09 108.1 BLL20050413ABE	44 36 05.10 72 37 49.40	0.100 -92	203	Green Mountain Technology	55.5R	8.6M
208B WVPR Windsor	LIC	CN VT	203.5 118.96 23.1 BMLED20120821ABT	43 26 15.30 72 27 06.30	1.700 694	83.2 975	Vermont Public Co.	55.9 9.7	23.6
260L1 WZNC-LP« Bethlehem	LIC	HN NH	138.5 20.78 318.6 BLL20140313AAW	44 16 48.00 71 41 24.70	0.100 -5	459	Friends Of The Colonial	5.5R	15.3M
209B R29336« Sherbrooke	ADD	QU	357.4 102.97 177.4	45 20 45.15 71 55 18.36	50.000 150	5.6 385	65.0	78.0R	25.0M
210A WCMD-FM Barre	LIC	CN VT	236.5 58.63 56.0 BLED20181005AAH	44 07 37.00 72 28 31.30	1.500 172	1.8 603	Christian Ministries, Inc.	11.2 25.5	33.6
207A AL2230« Victoriaville		QC	359.1 179.72 179.0	46 02 14.12 71 54 04.39	6.000 100	81.5 301	38.0	151.0R	28.7M
209B R43113« Sherbrooke	DEL	QU	1.3 108.54 181.3	45 23 48.15 71 49 52.34	50.000 150	6.4 382	65.0	78.0R	30.5M
209B AL3356« Fleurimont		QU	1.3 108.54 181.3	45 23 48.15 71 49 52.34	50.000 150	6.4 382	65.0	78.0R	30.5M
209B CBF-2« Sherbrooke	LIC DCN	QC	1.3 108.54 181.3	45 23 48.10 71 49 52.30	0.680 173	1.6 405	32.2	78.0R	30.5M

Terrain database is NGDC 30 SEC, R= 73.215 qualifying spacings or FCC minimum spacings in KM, M= Margin in KM
In & Out distances between contours are shown at closest points. Reference Zone= - Zone 2, Co to 3rd adjacent.
All separation margins (if shown) include rounding. Call signs with exclamation marks need not be protected.
Ant Column: (D= DA Standard, Z= DA 73.215, N= Not DA 73.215, _= Omni), Polarization (C,H,V,E), Beamtilt (Y,N,X)
« = Station meets FCC minimum distance spacing for its class.
Reference station has protected zone issue: Canada

Environmental Effect, RF Safety

The 60-meter proposed tower does not require FAA registration according to TOWAIR.

FM-Model using a 4-bay full-spaced “type 1” array of circularly-polarized antennas centered 54 meters using 4600 watts ERP shows a maximum exposure of 67 mW/cm² which is significantly less than the incidental 200 uW/cm² and occupational 1000 uW/cm² exposure limits.



Channel Selection	Channel 207 (89.3 MHz) ▼		
Antenna Type +	EPA Type 1: Ring-and-Stub or "Other" ▼		
Height (m)	<input type="text" value="54"/>	Distance (m)	<input type="text" value="50"/>
ERP-H (W)	<input type="text" value="4600"/>	ERP-V (W)	<input type="text" value="4600"/>
Num of Elements	<input type="text" value="4"/>	Element Spacing (λ)	<input type="text" value="1"/>
Num of Points	<input type="text" value="500"/>	<input type="button" value="Apply"/>	