

TECHNICAL EXHIBIT
APPLICATION FOR MODIFICATION
OF CONSTRUCTION PERMIT
RADIO STATION WICN
WORCESTER, MASSACHUSETTS
CH 213B1 1.1 KW (MAX-DA) 247 M

Technical Narrative

This Technical Exhibit was prepared on behalf of WICN Public Radio, Inc., licensee of noncommercial, educational FM (NCE-FM) station WICN. Station WICN is licensed (BMLED-20060501ANS) to operate on Channel 213B1 (90.5 MHz) at Worcester, Massachusetts, with a directional antenna (DA) maximum horizontal plane effective radiated power (ERP) of 8.1 kW and a vertical plane ERP of 7.2 kW using a Dielectric DA system having a main lobe orientation of 255 degrees true and an antenna height above average terrain (HAAT) is 113 meters. In addition, WICN is also authorized by outstanding construction permit (BPED-20070907ADU) to operate on channel 213B1 with a with a DA maximum horizontal plane ERP of 18.2 kW and a vertical plane ERP of 13 kW using a DA system having an antenna height above average terrain (HAAT) is 113 meters.

Proposed Facility

It is proposed to change transmitter site and operate on channel 213B1 with a DA maximum circularly polarized ERP of 1.1 kW employing a DA system with an HAAT of 247 meters. Figure 1 is a polar graph of the proposed antenna horizontal plane pattern envelope.

Tower Registration

Notification to the FAA is not necessary, as there is no proposed change in the overall height of the existing structure. The antenna structure registration number (ASRN) for the existing tower is 1003939.

Predicted Coverage Contours

The predicted 60 dBu contour was calculated in accordance with Section 73.313 of the FCC Rules. The average terrain elevations from 3 to 16 km were computed using the U.S.G.S. 3-second terrain database. The overall antenna HAAT was determined according to the provisions of Section 73.313 of the FCC Rules. The antenna radiation center HAAT in each radial direction and the ERP were used in conjunction with the propagation prediction curves of Section 73.333 to determine the distances to contours.

City Coverage

Figure 2 is a map showing the licensed and proposed predicted 60 dBu contours for the proposed facility. As indicated, the proposed 60 dBu will encompass 100% of the Worcester city limits (obtained from the 2000 Census) which comports with Section 73.515.

Allocation Study

Figure 3 provides a summary of an allocation study for the proposed facility. There are no intermediate frequency (IF) related facilities in close proximity to the proposed facility. The tabulation at Figure 3 lists the results of a numerical analysis of the potential for contour overlap for all nearby co-channel and first-, second-, and third-adjacent-channel facilities. For the purposes of the numerical study, the maximum HAAT and ERP values were used in calculating the maximum distance to the predicted service and interfering contours.

Figure 4 is a map depicting the predicted protected and interfering contours of those stations close enough to warrant further study. This is based on the numerical analysis in Figure 3, where there is an indication of the potential for prohibited overlapping contours. As indicated in Figures 3 and 4, the allocation requirements for the proposed facility are fully met with respect to all pertinent facilities. Therefore, it is believed that all of the requirements of Section 73.509 have been met.

Canadian Allocation Study

The proposed site is 302 kilometers from the closest point of the Canadian Border. The 34 dBu F(50,10) Canadian interfering contour for the proposed WICN operation is shown on Figure 5. This contour does not extend into Canada and, thus, no Canadian impact is expected to occur. Therefore, the proposal appears to comply with the U.S./Canada FM Agreement. If necessary, it is respectfully requested that the Commission coordinate the proposal with Canada.

TV Channel 6 Protection

It is required that noncommercial educational FM facilities provide interference protection to affected TV channel 6 facilities as defined in Section 73.525. Pursuant to Section 73.525 (a) (1), all TV channel 6 facilities within 193 kilometers of a proposed channel 213 FM facility must be protected. Station WLNE-TV is the only station which WICN would be involved in normally prohibited contour overlap. In accordance with Section 73.525, a noncommercial educational FM modification application that is accompanied by a written agreement between the NCE-FM applicant and the affected TV channel 6 broadcast station will be accepted. Therefore, the applicant has obtained a written agreement with the licensee of WLNE-TV stating that it concurs with the NCE-FM facilities. A copy of this agreement is attached elsewhere to this application.

Environmental Considerations

The proposed WICN channel 213B1 facilities were evaluated in terms of potential radiofrequency radiation exposure at 2 meters above ground level in accordance with the OST Bulletin No. 65, "Evaluating Compliance With FCC-Specified Guidelines for Human Exposure to Radiofrequency Radiation". This Bulletin provides assistance in determining whether FCC-regulated transmitting facilities, operations or devices comply with limits for human exposure to radiofrequency (RF) electromagnetic fields.

The proposed antenna will be mounted at the 63-meter level on the existing tower structure. The calculated power density at 2 meters above ground level at the base of the tower was calculated using the appropriate equation contained in the Bulletin. Using a "greater than expected" vertical relative field value of 0.7 for the proposed directional antenna, the total ERP of 2.2 kW (H+V) and an antenna center of radiation height above ground level of 63 meters, the calculated power density at two meters above ground level at the base of the tower is 0.0097 milliwatts per square centimeter (mW/cm^2), or 4.8% of the Commission's recommended limit applicable to uncontrolled exposure areas ($0.2 \text{ mW}/\text{cm}^2$ for FM channel 213). Therefore, based on the responsibility threshold of 5%, the proposal will comply with the RF emission rules.

Access to the tower site will be restricted. Furthermore, the site will be appropriately marked with RFR warning signs. In addition, as this is a multi-user site, procedures will be in effect in the event that workers or other authorized personnel enter the restricted area or climb the tower to ensure that appropriate measures will be taken to assure worker safety with respect to radio frequency radiation exposure. Such procedures include reducing the average exposure by spreading out the work over a longer period of time, wearing "accepted" RFR protective clothing and/or RFR exposure monitors or scheduling work when the station is at reduced power or shut down.

Finally, it is noted that this technical exhibit only addresses the potential for radiofrequency electromagnetic field exposure. All other aspects of the environmental processing analysis will be or already has been provided to the FCC by the tower owner as part of the tower registration process.



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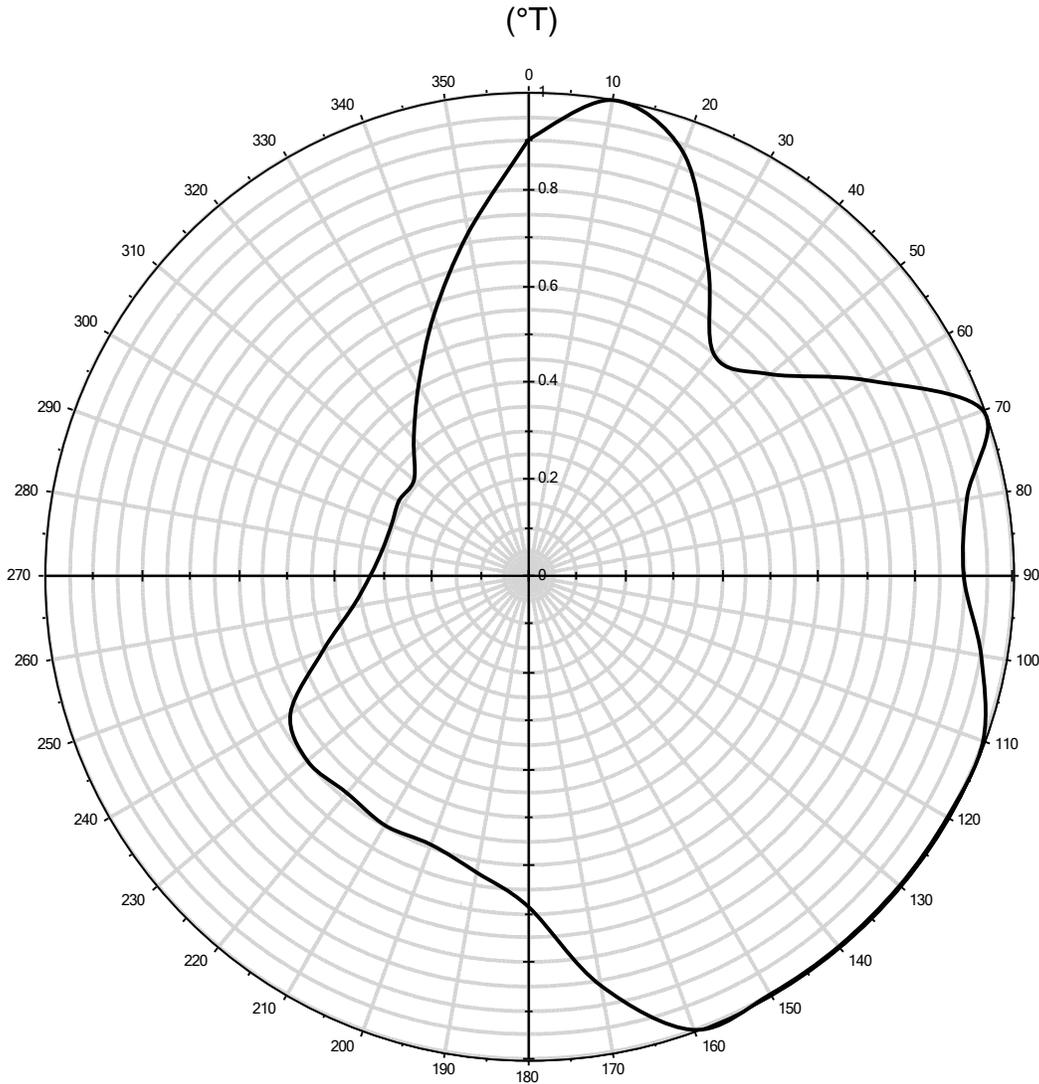
May 14, 2009



DA Inquiry

du Treil, Lundin, & Rackley, Inc., Sarasota, Florida

Antenna Pattern: Antenna ID: 80019980



Note: display reflects rotation of 0.00°

Antenna Details:

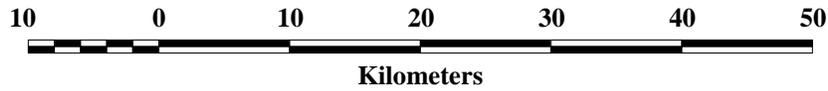
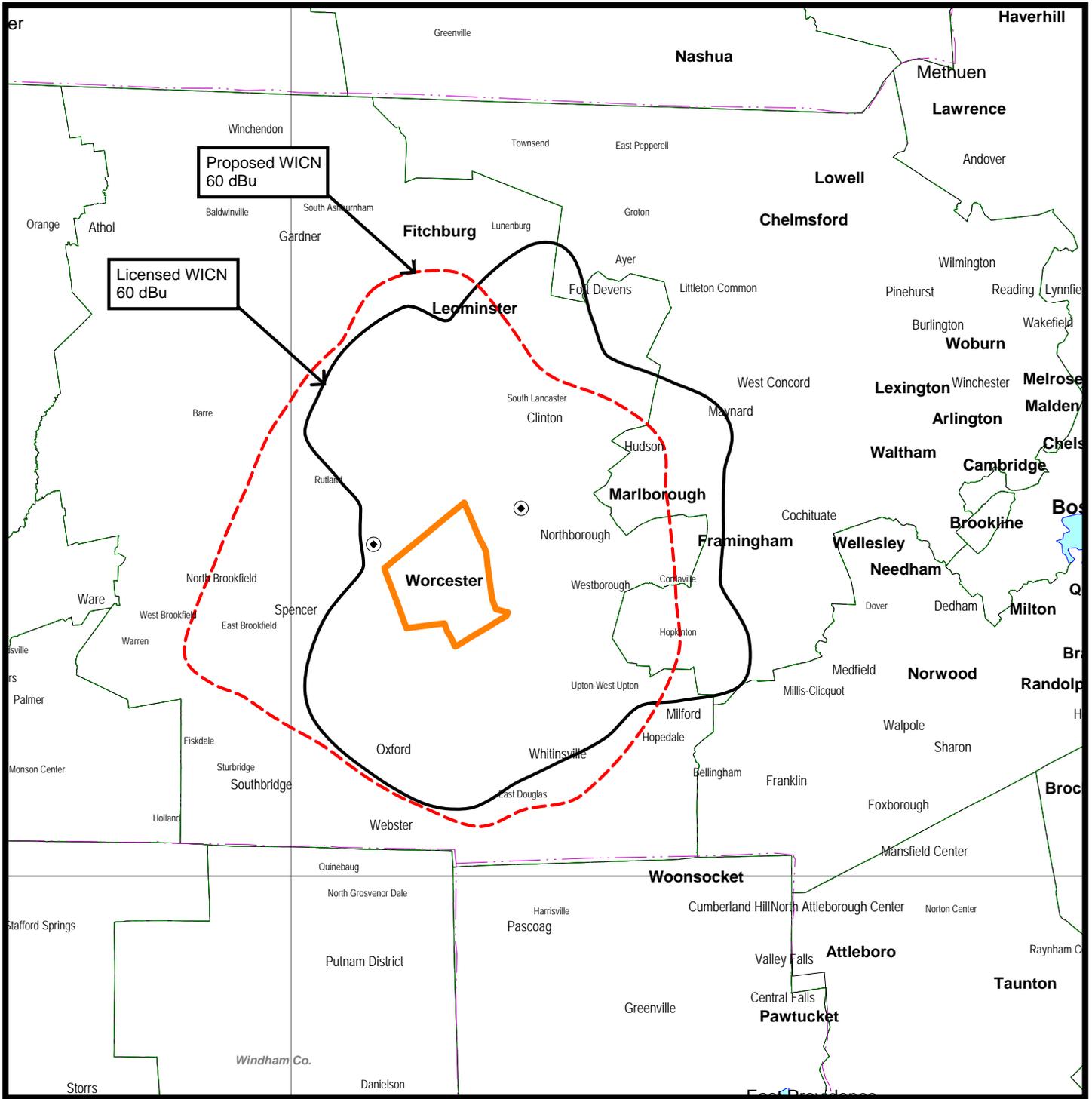
0°	0.904	60°	0.810	120°	1.000	180°	0.686	240°	0.569	300°	0.310
10°	1.000	70°	1.000	130°	1.000	190°	0.623	250°	0.453	310°	0.310
20°	0.933	80°	0.920	140°	1.000	200°	0.592	260°	0.370	320°	0.370
30°	0.742	90°	0.900	150°	1.000	210°	0.596	270°	0.328	330°	0.456
40°	0.597	100°	0.950	160°	1.000	220°	0.586	280°	0.308	340°	0.574
50°	0.650	110°	1.000	170°	0.862	230°	0.597	290°	0.303	350°	0.721

Antenna Make: NEW

Antenna Model: WICN

Standard Pattern:

Last Change Date:



PREDICTED FCC COVERAGE CONTOURS

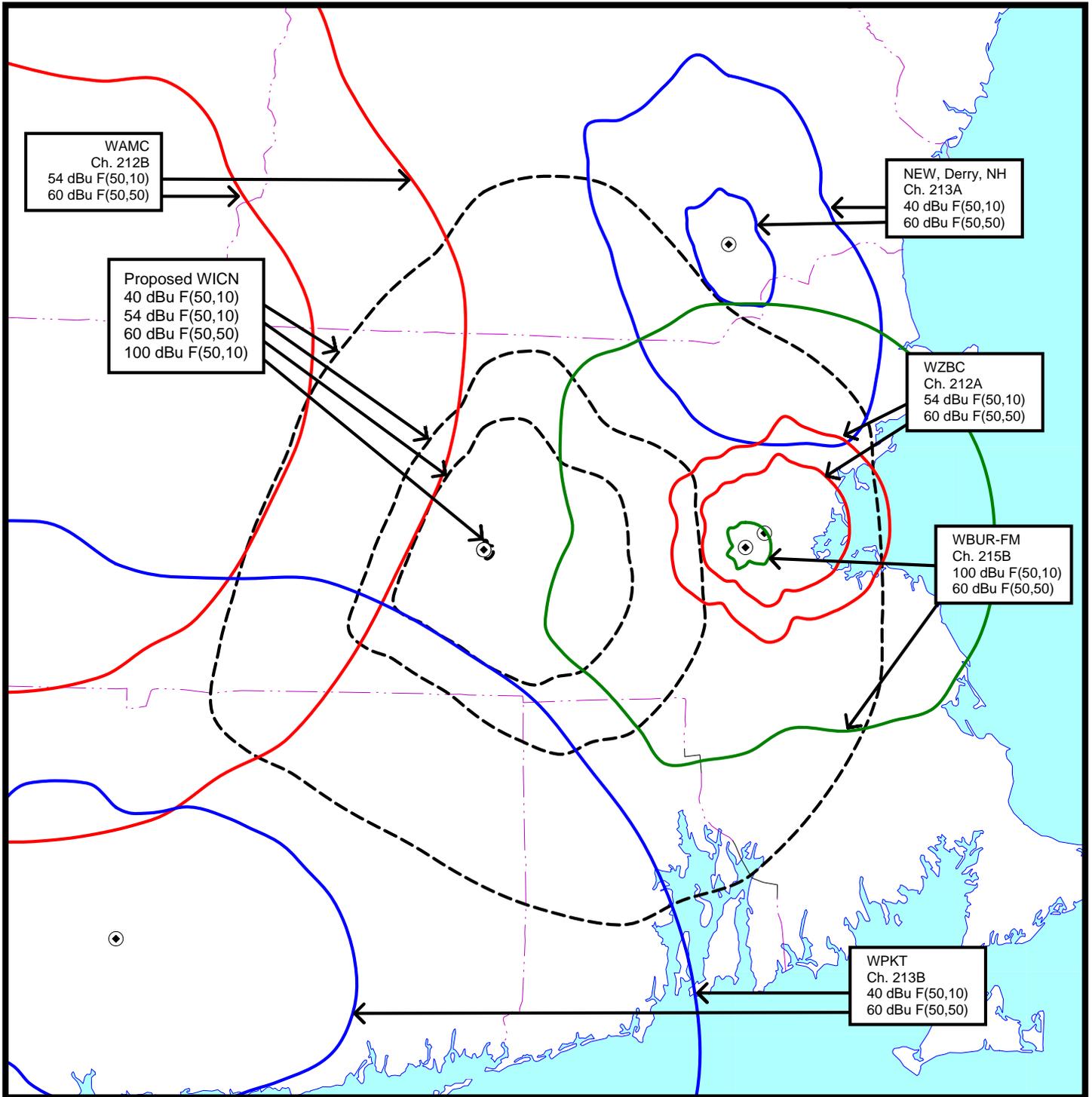
FM STATION WICN
WORCESTER, MASSACHUSETTES
CH 213B1 1.1 KW (MAX-DA) 247 M

du Treil, Lundin & Rackley, Inc. Sarasota, Florida

Callsign ID	City St.	File Status	Channel Freq	ERP(kW) HAAT(m)	DA ID	Latitude Longitude	73 215	Bear (deg)	Dist. (km)	Req. (km)
NEW 173234	AUBURN NH	BNPED APP	213 A 90.5	0.1 43	N	42-57-25 071-21-39.1	N 31.0	84.95	96.3	Short
Proposed	60.0 dBu	Desired = 6.7 km	Proposed	40.0 dbu	Undesired = 89.6	NEW	40.0 dbu	Undesired = 22.4		
WSPS 62166	CONCORD NH	BLED LIC	213 A 90.5	0.2 27	N	43-11-37 071-34-29	N 14.8	102.4	96.3	Close
Proposed	60.0 dBu	Desired = 6.7 km	Proposed	40.0 dbu	Undesired = 89.6	WSPS	40.0 dbu	Undesired = 22.4		
WPEA 68250	EXETER NH	BLED LIC	213 A 90.5	0.1 35	N	42-58-44 070-57-00	N 45.6	108.07	95.6	Close
Proposed	60.0 dBu	Desired = 6.0 km	Proposed	40.0 dbu	Undesired = 89.6	WPEA	40.0 dbu	Undesired = 20.1		
WPKT 13627	MERIDEN CT	BLED LIC	213 B 90.5	18.5 314	Y	41-33-42 072-50-41	N 223.9	113.8	168.0	Short
Proposed	60.0 dBu	Desired = 56.7 km	Proposed	40.0 dbu	Undesired = 89.6	WPKT	40.0 dbu	Undesired = 134.8		
WSMA 122202	SCITUATE MA	BLED LIC	213 B1 90.5	7.7 164	Y	41-56-02 070-35-10	N 110.3	115.97	133.4	Short
Proposed	60.0 dBu	Desired = 37.7 km	Proposed	40.0 dbu	Undesired = 89.6	WSMA	40.0 dbu	Undesired = 100.2		
WSMA 122202	SCITUATE MA	BLED APP	213 B1 90.5	7.7 164	Y	41-56-02 070-35-10	N 110.3	115.97	133.4	Short
Proposed	60.0 dBu	Desired = 37.7 km	Proposed	40.0 dbu	Undesired = 89.6	WSMA	40.0 dbu	Undesired = 100.2		
WTCC 62018	SPRINGFIELD MA	BLED LIC	214 A 90.7	4.0 73	N	42-06-32 072-34-45	N 249.2	60.26	72.4	Short
Proposed	60.0 dBu	Desired = 22.3 km	Proposed	54.0 dbu	Undesired = 50.1	WTCC	54.0 dbu	Undesired = 33.3		
NEW 171698	PLAINFIELD CT	BNPED APP	214 A 90.7	0.9 168	Y	41-42-45.6 071-49-08.7	N 174.3	65.9	73.3	Short
Proposed	60.0 dBu	Desired = 23.2 km	Proposed	54.0 dbu	Undesired = 50.1	NEW	54.0 dbu	Undesired = 34.7		
NEW 173091	WAUREGAN CT	BNPED APP	214 A 90.7	1.152 119	Y	41-40-29 071-52-47	N 178.8	69.81	71.1	Short
Proposed	60.0 dBu	Desired = 21.0 km	Proposed	54.0 dbu	Undesired = 50.1	NEW	54.0 dbu	Undesired = 31.1		
NEW 175975	DANIELSON CT	BNPED APP	214 A 90.7	1.7 185	Y	41-39-44 071-50-51	N 176.6	71.3	78.0	Short
Proposed	60.0 dBu	Desired = 27.9 km	Proposed	54.0 dbu	Undesired = 50.1	NEW	54.0 dbu	Undesired = 42.1		
NEW 159759	HOPE VALLE RI	BNPED APP	214 A 90.7	0.53 146	Y	41-38-27 071-45-12	N 170.7	74.52	69.3	Close
Proposed	60.0 dBu	Desired = 19.2 km	Proposed	54.0 dbu	Undesired = 50.1	NEW	54.0 dbu	Undesired = 28.3		

Callsign ID	City St.	File Status Number	Channel Freq	ERP(kW) HAAT(m)	DA ID	Latitude Longitude	73 215	Bear (deg)	Dist. (km)	Req. (km)
WLMW 35251	MANCHESTER NH	BLED LIC 19970829KB	214 A 90.7	0.015 265	Y	42-58-59 071-35-25	N	18.3	79.64 18.98	60.7 Clear
WLMW Proposed	60.0 60.0	dBu dBu	Desired = 10.5 km Desired = 33.2 km	Proposed WLMW	54.0 54.0	dbu dbu	Undesired = 50.1 Undesired = 14.7			
WEVN 48440	KEENE NH	BLED LIC 20030815ADI	214 B1 90.7	1.5 412	Y	43-02-00 072-22-04	N	334.8	89.81 -3.82	93.6 Short
WEVN Proposed	60.0 60.0	dBu dBu	Desired = 39.8 km Desired = 33.2 km	Proposed WEVN	54.0 54.0	dbu dbu	Undesired = 50.1 Undesired = 60.4			
WJHD 53078	PORTSMOUTH RI	BLED LIC 19851106KB	214 A 90.7	0.36 45	N	41-36-06 071-16-20	N	146.2	93.59 33.88	59.7 Clear
WJHD Proposed	60.0 60.0	dBu dBu	Desired = 9.6 km Desired = 33.2 km	Proposed WJHD	54.0 54.0	dbu dbu	Undesired = 50.1 Undesired = 13.4			
WBUR-FM 68241	BOSTON MA	BLED LIC 20050812AGN	215 B 90.9	12.0 333	Y	42-18-27 071-13-27	N	89.3	55.55 -0.52	56.1 Short
WBUR-FM Proposed	60.0 60.0	dBu dBu	Desired = 53.9 km Desired = 33.2 km	Proposed WBUR-FM	100.0 100.0	dbu dbu	Undesired = 2.1 Undesired = 5.5			
NEW 171988	EAST BROOK MA	BNPED APP 20071022AUG	216 A 91.1	0.45 138	Y	42-17-13 072-06-32	N	264.2	17.5 -17.09	34.6 Short
NEW Proposed	60.0 60.0	dBu dBu	Desired = 17.8 km Desired = 33.2 km	Proposed NEW	100.0 100.0	dbu dbu	Undesired = 2.1 Undesired = 1.4			
WKMY 92287	WINCHENDON MA	BLED LIC 20060302ACZ	216 A 91.1	0.06 190	N	42-42-09 072-02-18	N	345.5	45.85 12.07	33.8 Close
WKMY Proposed	60.0 60.0	dBu dBu	Desired = 12.5 km Desired = 33.2 km	Proposed WKMY	100.0 100.0	dbu dbu	Undesired = 2.1 Undesired = .5			
WBVC 91189	POMFRET CT	BLED LIC 20010223AAC	216 A 91.1	0.1 162	N	41-53-27 071-57-24	N	186.1	46.05 12.11	33.9 Close
WBVC Proposed	60.0 60.0	dBu dBu	Desired = 13.1 km Desired = 33.2 km	Proposed WBVC	100.0 100.0	dbu dbu	Undesired = 2.1 Undesired = .7			
WMUA 69184	AMHERST MA	BLED LIC 20031110ACU	216 A 91.1	0.45 134	N	42-23-37 072-31-21	N	281.3	52.45 17.86	34.6 Clear
WMUA Proposed	60.0 60.0	dBu dBu	Desired = 17.5 km Desired = 33.2 km	Proposed WMUA	100.0 100.0	dbu dbu	Undesired = 2.1 Undesired = 1.3			

Figure 4

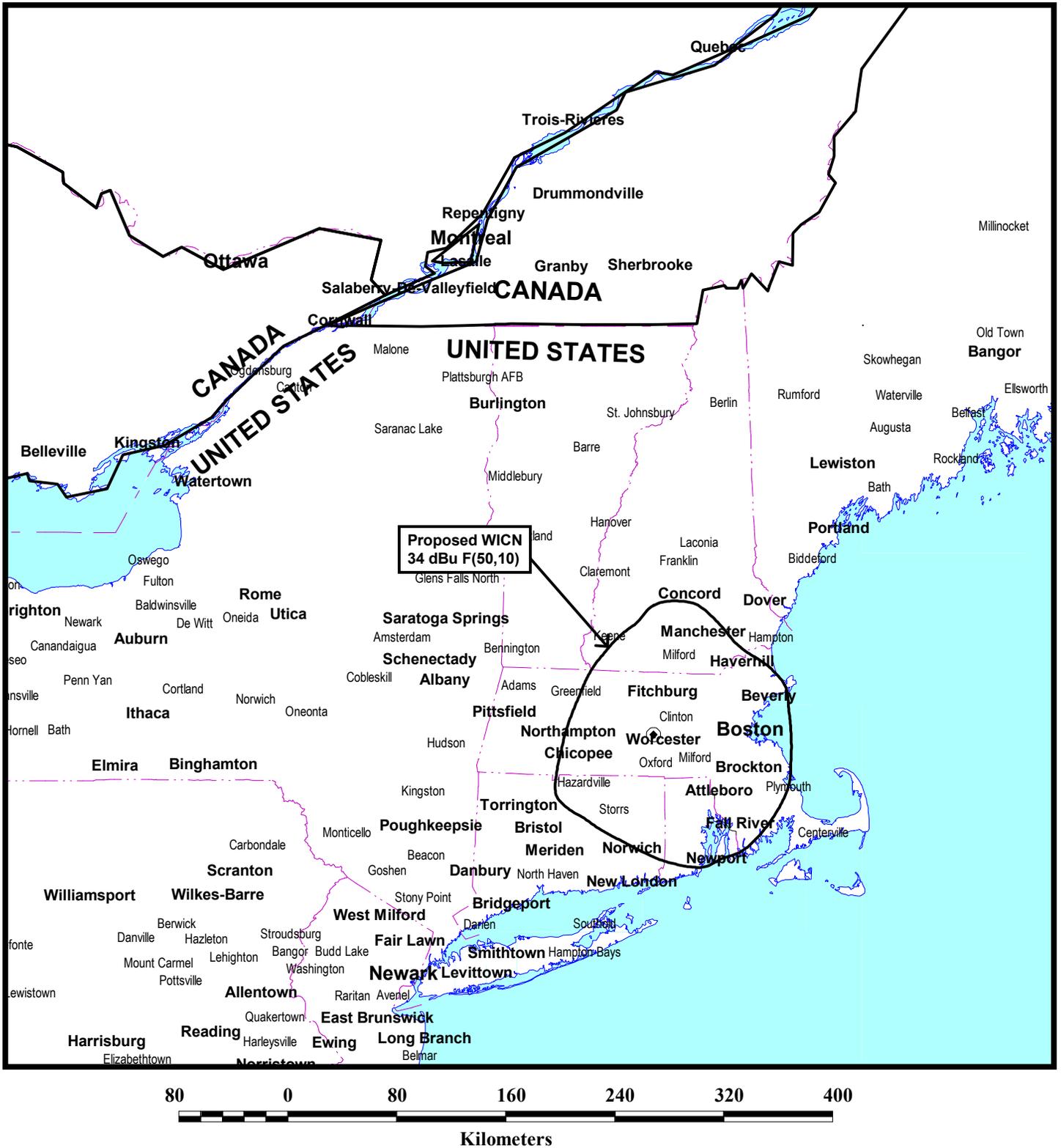


ALLOCATION STUDY

FM STATION WICN
WORCESTER, MASSACHUSETTES
CH 213B1 1.1 KW (MAX-DA) 247 M

du Treil, Lundin & Rackley, Inc. Sarasota, Florida

Figure 5



CANADIAN ALLOCATION STUDY

FM STATION WICN
WORCESTER, MASSACHUSETTES
CH 213B1 1.1 KW (MAX-DA) 247 M

du Treil, Lundin & Rackley, Inc. Sarasota, Florida

ELECTRONICS RESEARCH, INC.
108 MARKET STREET
NEWBURGH, IN. 47630

----- THEORETICAL -----
VERTICAL PLANE RELATIVE FIELD

MAY 24, 1993
ELEMENT SPACING:
0.5 WAVELENGTH

4 ERI TYPE SHP, SHPX, LP, OR LPX ELEMENTS
0 DEGREE(S) BEAM TILT
0 PERCENT FIRST NULL FILL

POWER GAIN IS 1.907 IN THE HORIZONTAL PLANE(1.907 IN THE MAX.)

FIGURE #4

