

Proposed Minor Modification to CP for W272CG at Sanford, Maine

Technical Statement

Summary

This application proposes a minor modification of Construction Permit BMPFT-20130211AAG to specify a different tower at the Mt. Hope “antenna farm.” This is a move of 330 meters with a change of antenna location, height, DA pattern, and ERP, but no change of antenna type.

As is the case for the underlying CP (BMPFT-20130211AAG), the proposed service contour lies entirely within the 2 mV/m service contour of WWSF as illustrated in Figure 1A.

The underlying CP was premised on a “Mattoon Waiver.” The proposed minor modification continues to qualify for this waiver as shown in Figure 1B. The original waiver request is restated below with supporting statement provided in Exhibit A to Attachment 12.

Time is of the essence because the licensed facility is dark. The applicant has all equipment on hand in preparation for constructing the facility as presently authorized, and will employ it expeditiously to construct the facility proposed herein, if granted. Expediting processing is therefore respectfully requested. This request will be submitted separately to the Secretary of the Commission.

Allowed Move Subject to Waiver of Section 74.1233(a)(1) (“Mattoon Waiver”)

Both the licensed and proposed antenna sites are outside of any market named in the *Report and Order In the Matter of Creation of A Low Power Radio Service, and Amendment of Service and Eligibility Rules for FM Broadcast Translator Stations, Third Further Notice of Proposed Rule Making, FCC 11-105, July 12, 2011*. Therefore, the proposed move will not foreclose any further licensing opportunities for LPFM stations.

The 40 dBu F(50,10) interfering contour of the proposed amended facility overlaps the 60 dBu F(50,50) service contour of the licensed facility (File No. BLFT-20070917ABM) as illustrated in Figure 2. Hence, the facilities are mutually exclusive for purposes of the requested waiver.

A waiver of Section 74.1233(a)(1) is hereby respectfully requested. Support for this request is provided in Exhibit A to Attachment 12 of this application.

74.1204 Study

All facilities not meeting the spacing requirements of Section 73.207 with respect to the proposed Channel 272 facility considered as a Class A were studied. These include:

<u>Call Sign</u>	<u>Location</u>	<u>Channel No.</u>
WPOR	Portland, ME	270B
WSAK	Hampton, NH	271A
WWHK	Concord, NH	272A
W272BV	Yarmouth, ME	272D
WBLM	Portland, ME	275C

Figure 2 illustrates the absence of prohibited overlap between the proposed translator interfering contours and the 60 dBu service contours of WSAK, WWHK, and W272BV. (Key: same colors may not overlap.)

The presently authorized site lies within the service contours of both WPOR and WBLM. Therefore, the applicant hereby respectfully requests a waiver pursuant to 74.1204(d) as described below.

As shown in Figure 1, WPOR places a 58.7 dBu service contour over the proposed site, and WBLM places a 69.0 dBu service contour over the proposed site. The Commission has generally considered overlap from a proposed translator interfering contour to be acceptable where the ratio of undesired to desired signal (U/D) does not exceed 40 dB i.e. where in the instant case the proposed translator F(50,10) interfering signal does not exceed 98.7 dBu.

Interference Protection to All Nearby Residences, Businesses, and Roadways

The proposed translator facility will operate with an maximum ERP of 0.05 kW (H&V.) For an ERP of 0.05 kW, the distance to the 98.7 dBu F(50,10) contour in free space is 576 meters.

For purposes of conservatively establishing the absence of interference, all land within a 576 meter radius was considered to be at the same elevation as the highest land in the vicinity, that elevation being 692 feet = 211 meters AMSL as shown on the USGS Topo Map in Figure 3.

As with the underlying CP, the proposed directional antenna is an OMB MP-4. This is an array of four MP-series antenna bays spaced 0.75 wavelengths apart with the center of radiation at 318 meters AMSL and oriented at 45 degrees True (previously 30 degrees True.) The array produces a vertical radiation pattern that prevents the 98.7 dBu F(50,10) interfering contour from reaching the highest ground at any point within 576 meters of the antenna site location. The antenna vertical pattern is illustrated and field values tabulated in Attachments A-1 and A-2.

Based on the actual distance in space from the antenna center of radiation to points at the level of the highest ground, the table in Attachment B provides calculations of the interference protection at distances between 150 meters and 600 meters from the proposed site in order to establish that the interfering contour does not reach the ground at any point.

For each point, the downward angle and actual distance in space from the proposed antenna center of radiation is shown together with the maximum allowable ERP, the maximum allowable field relative to 50 Watts = 1.000, a comparison with the actual field produced by the antenna, and the margin of safety in dB. As shown in Attachment B, the margin of safety is greater than 4.99 dB at any point between 150 meters and 600 meters, beyond the free-space contour distance.

The two nearest residences are 210 meters from of the antenna site as shown in Figure 3. These are each considered separately to assure that no interference will occur to WPOR.

Residence 1 is at an elevation of 211 meters AMSL and at an azimuth of 335 degrees True. The actual distance in space from the antenna center of radiation to Residence 1 is 235.7 meters. Hence the power limit toward Residence 1 is 8.4 Watts, and the corresponding field limit is 0.410 given an ERP of 50 Watts. The DA pattern field at 335 degrees True is 0.850 and the vertical pattern field at the downward angle to the residence (27 degrees) is 0.237. The field toward Residence 1 is the product of the two, or 0.201. The margin of safety at Residence 1 is thus found to be 6.19 dB as shown in Attachment B.

Residence 2 is at an elevation of 189 meters AMSL and thus 129 meters below the antenna center of radiation. The DA pattern field was considered to be 1.000. Similarly, the margin of safety is found to be 9.87 dB to this Residence 2, also as shown in Attachment B.

Area roads are lightly traveled and there are no major roads in the vicinity. All residences beyond Residences 1 and 2 receive even greater protection as shown in Attachment B.

The applicant therefore believes its application meets the requirements of Section 74.1204(d) with respect to “other factors” insuring no actual interference to either WPOR or WBLM. Should any actual interference occur, the applicant will take the required steps to eliminate it.

Environmental Considerations

The proposed antenna will be mounted on an existing tower with no new construction. RFR compliance was determined through the use of the RF worksheets in Appendix A. The applicant will cease operation or reduce power as necessary, in order to prevent uncontrolled or controlled exposure in excess of the guidelines of OET-65.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Dennis Jackson', with a stylized flourish at the end.

Dennis Jackson
Technical Consultant
July 11, 2013

Figure 1A

Proposed service contour lies entirely within the 2 mV/m contour of proposed primary station WWSF(AM).

Third adjacent WPOR places 58.7 dBu over the proposed site.

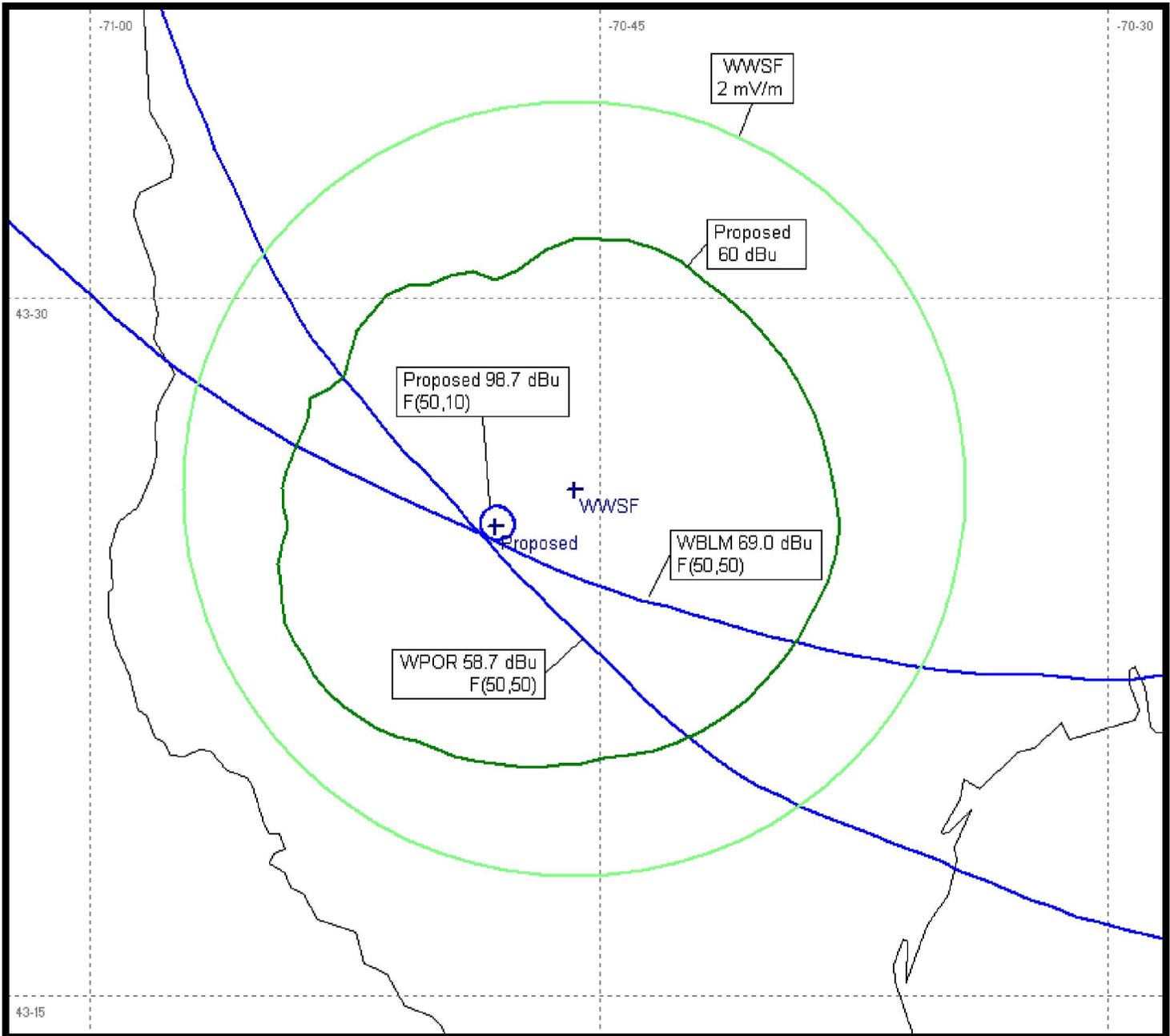


Figure 1B

Continued Eligibility for “Mattoon Waiver”

Underlying CP (BMPFT-20130211AAG) was granted with a “Mattoon Waiver.”

Proposed 40 dBu F(50,10) interfering contour continues to overlap service contour from licensed site (BLFT-20070917ABM).

Proposed facility remains a fill-in for proposed primary station WWSF(AM) at Sanford, ME.

Therefore, eligibility for the waiver is unaffected by the proposed minor change.

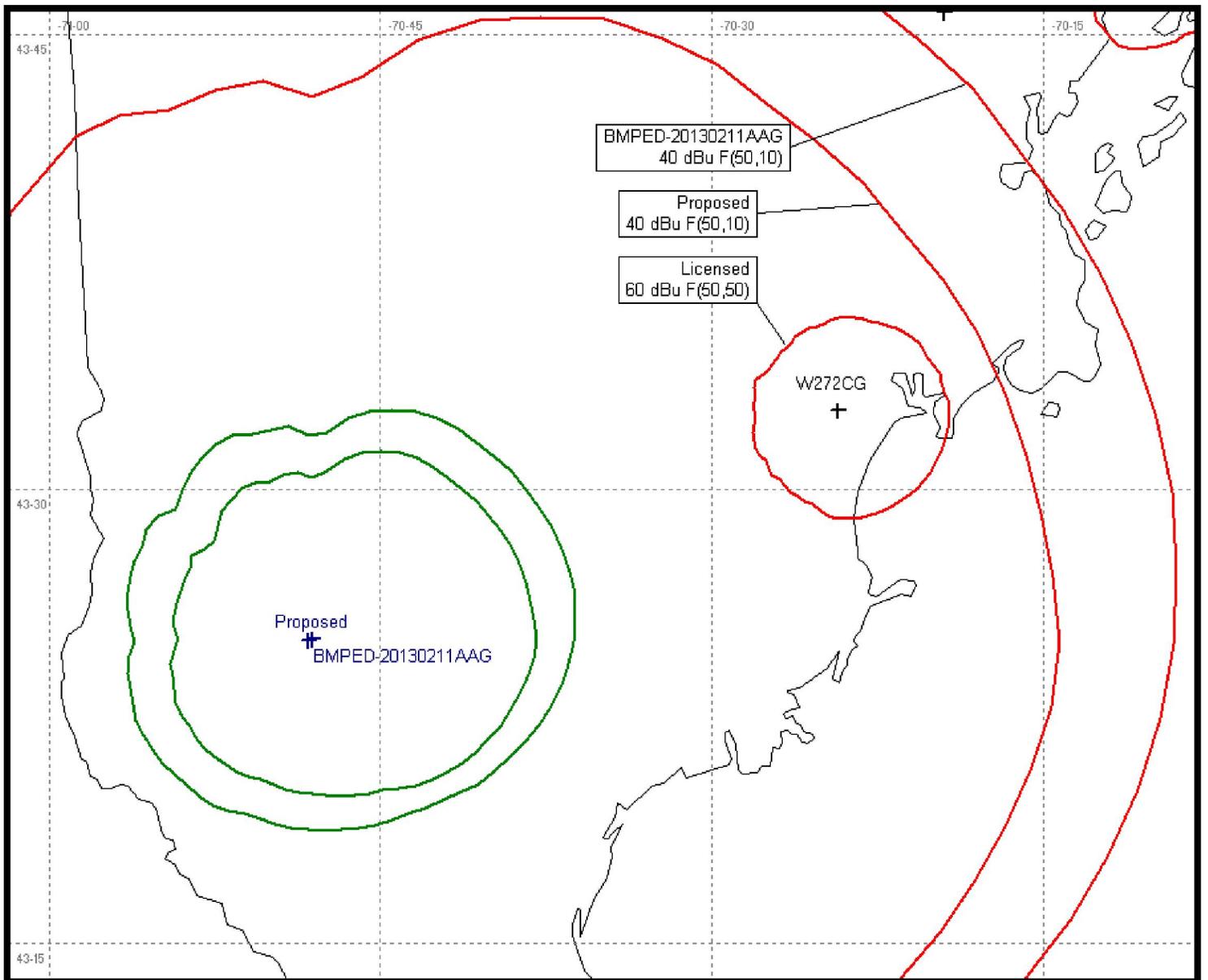


Figure 2 - 74.1204 Study

**Proposed interfering contours do not overlap 60 dBu service contours
of WWHK, WSAK, or W272BV.**

(Key: Same colors may not overlap.)

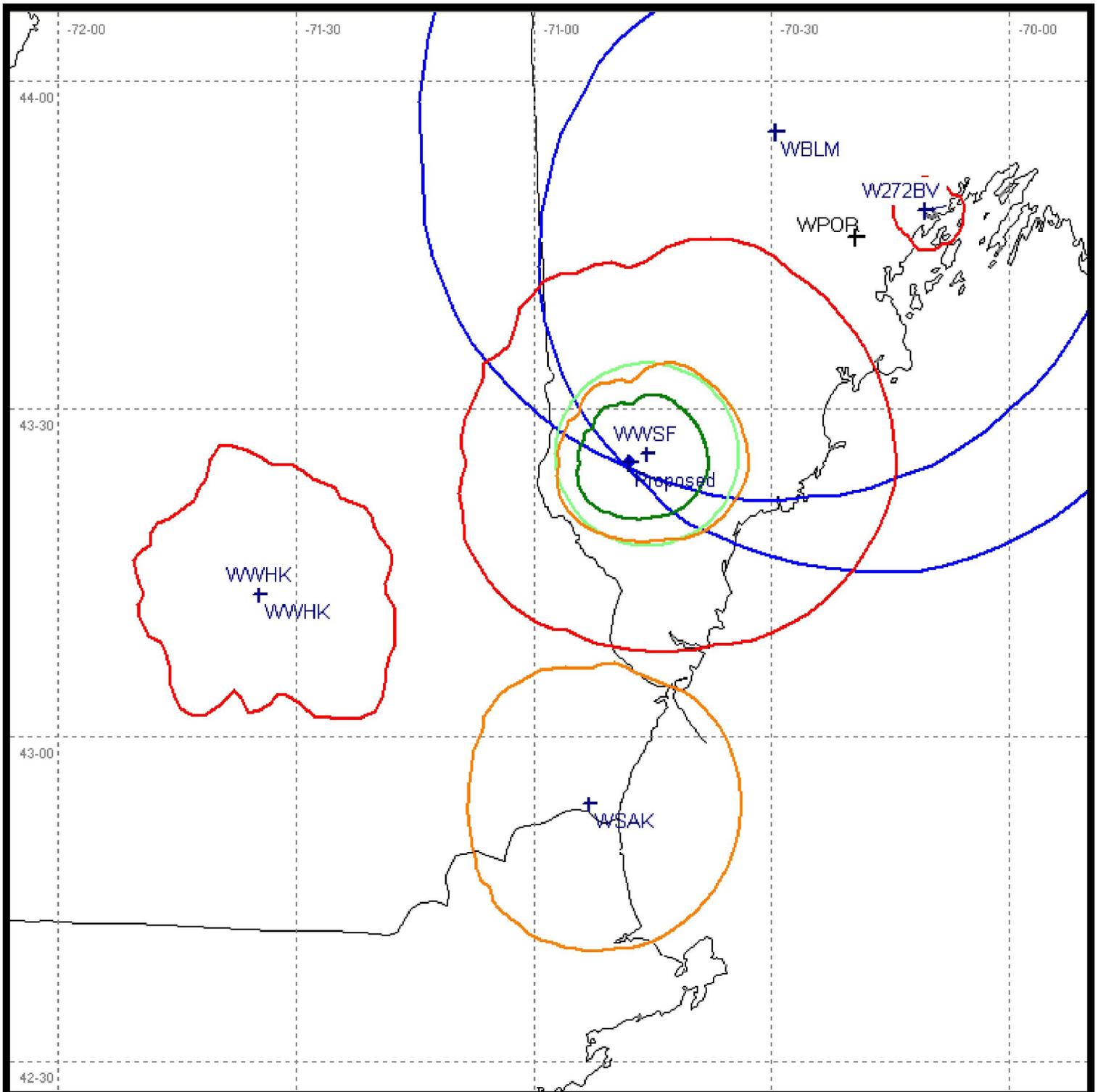
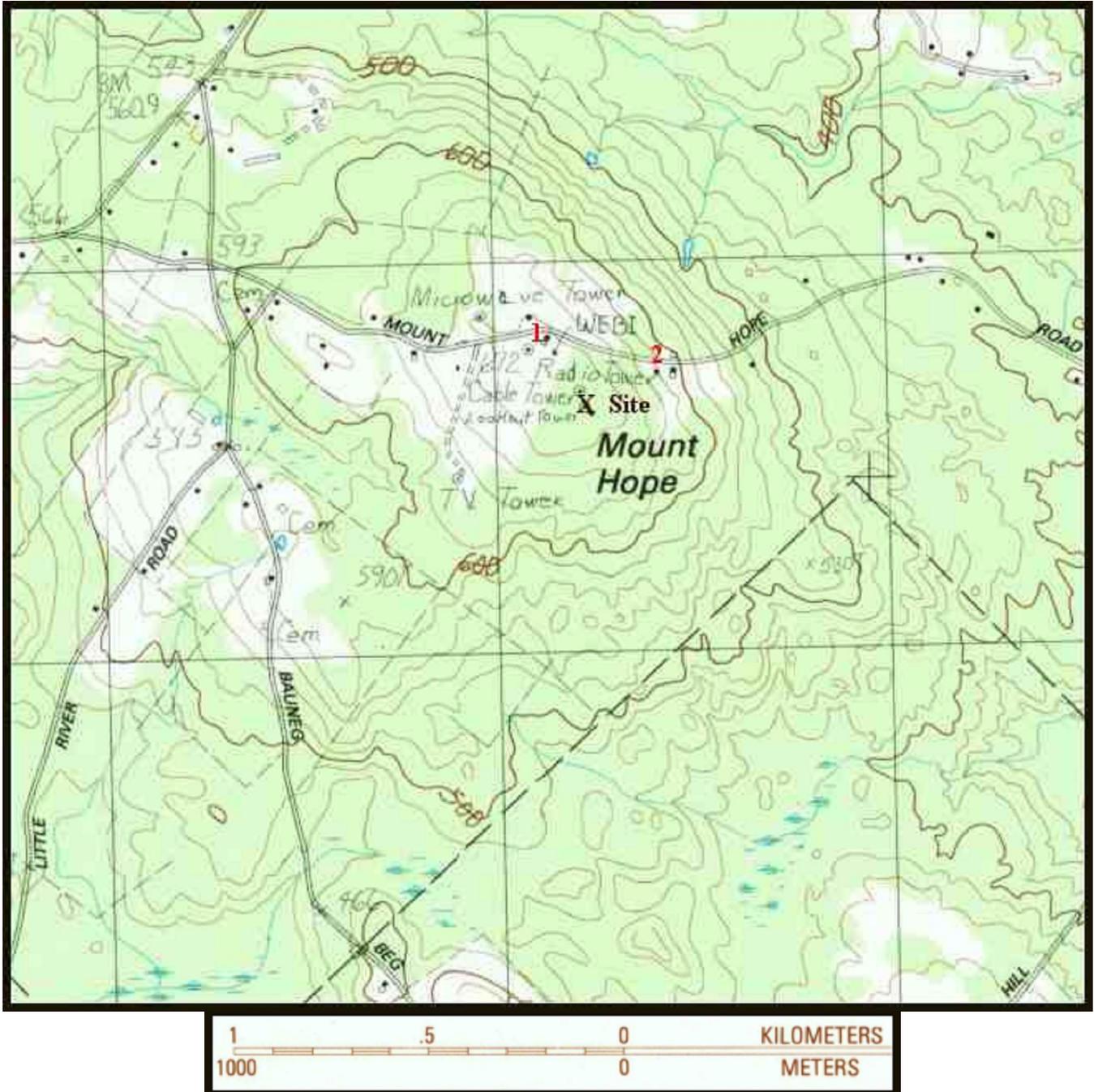


Figure 3

USGS Topo Map of Antenna Site Vicinity

Highest ground in the vicinity of the proposed site is 692 feet = 211 meters AMSL

The two closest residences (1 and 2), each 210 meters horizontally from the proposed antenna site, are each studied separately in Attachment B.



Attachment A-1

Antenna Vertical Radiation Profile



Certific. E401-022



Certific. E401-2021

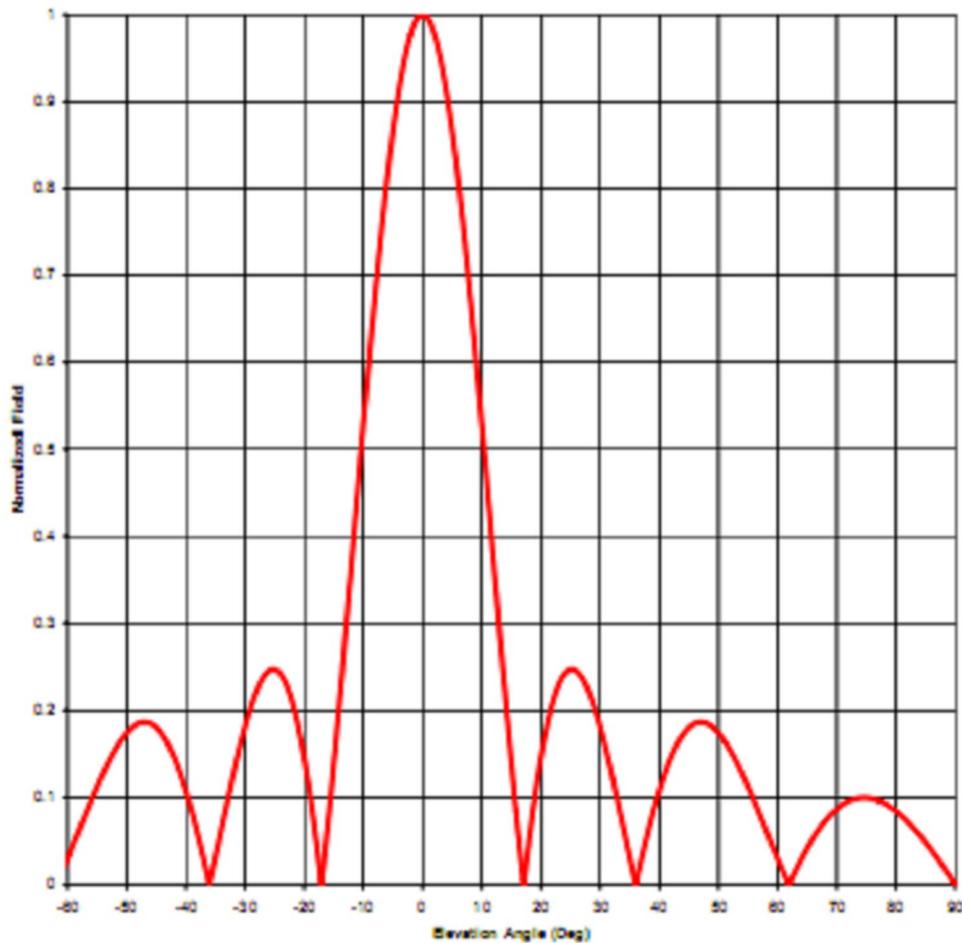
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MP-4 ELEVATION PATTERN

Antenna Type: MP-4

Frequency: 98.1MHz



Attachment A-2

Antenna Vertical Profile Field Values



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ELEVATION PATTERN TABULATION			
Degrees	Relative Field	Degrees	Relative Field
1	0.994	46	0.185
2	0.978	47	0.186
3	0.951	48	0.185
4	0.913	49	0.181
5	0.868	50	0.174
6	0.811	51	0.165
7	0.748	52	0.154
8	0.680	53	0.142
9	0.608	54	0.127
10	0.529	55	0.112
11	0.450	56	0.098
12	0.370	57	0.080
13	0.291	58	0.063
14	0.214	59	0.047
15	0.140	60	0.030
16	0.070	61	0.014
17	0.008	62	0.001
18	0.051	63	0.016
19	0.102	64	0.029
20	0.148	65	0.042
21	0.181	66	0.053
22	0.209	67	0.064
23	0.229	68	0.073
24	0.242	69	0.080
25	0.247	70	0.087
26	0.245	71	0.092
27	0.237	72	0.096
28	0.223	73	0.098
29	0.204	74	0.100
30	0.181	75	0.100
31	0.155	76	0.099
32	0.128	77	0.097
33	0.098	78	0.093
34	0.064	79	0.089
35	0.032	80	0.084
36	0.001	81	0.079
37	0.029	82	0.072
38	0.057	83	0.065
39	0.084	84	0.057
40	0.108	85	0.049
41	0.128	86	0.040
42	0.148	87	0.030
43	0.161	88	0.021
44	0.172	89	0.011
45	0.180	90	0.000

Attachment B

Calculation of Maximum Allowable Field

At Pertinent Distances and Angles

Compared to Actual Antenna Field Values

Illustrating Margin of Safety

Notes:

1. Antenna Center of Radiation is at 318 meters AMSL, i.e. 107 meters above the highest ground level in the vicinity (692 feet = 211 meters AMSL.)
2. Nearest residences are 210 meters from antenna site as shown in Figure 3.

Residence 1 is at an elevation of 211 meters AMSL and thus 107 meters below the antenna center of radiation at an azimuth of 335 degrees True. DA pattern field value at 335 degrees True is 0.850 and the vertical pattern field at the downward angle to the residence (27 degrees) is 0.237. The field toward Residence 1 is the product of the two, or 0.201.

Residence 2 is at a lower elevation of 189 meters AMSL and thus 129 meters below the antenna center of radiation. DA pattern field is taken to be 1.000 and vertical pattern field at the downward angle to Residence 2 (31.6 degrees) is 0.137.

3. All other land within 600 meters of antenna site is considered to be at the maximum height in the vicinity as shown in Figure 3. In fact, however, the terrain and closest roads descend steeply from the antenna site, increasing protection from that shown.
4. Margin of Safety is 4.99 dB or greater at any point between 150 and 600 meters, including at the nearest residences.

Horizontal Distance to Point (meters)	Residence	Height Difference (meters)	Downward Vertical Angle (degrees)	Actual Distance in Space (meters)	Power Limit (Watts)	Antenna Field Limit	Actual Antenna Field	Margin of Safety (dB)
150		107	35.5	184.3	5.1	0.319	0.017	25.48
175		107	31.4	205.1	6.3	0.355	0.171	6.34
200		107	28.1	226.8	7.7	0.392	0.221	4.99
210	1	107	27.0	235.7	8.4	0.410	0.201	6.19
210	2	129	31.6	246.5	9.1	0.427	0.137	9.87
250		107	23.2	271.9	11.1	0.471	0.232	6.15
300		107	19.6	318.5	15.2	0.551	0.128	12.68
400		107	15.0	414.1	25.8	0.718	0.140	14.20
500		107	12.1	511.3	39.3	0.887	0.368	7.64
600		107	10.1	609.5	55.9	1.057	0.521	6.15