Proposed Minor Modification

W292FI at Waterbury, Connecticut • Facility ID 200742

Technical Statement

Summary

This application proposes a minor change to W292FI in order to more fully fill in the service contour of co-owned primary station WWCO(AM). The proposed service contour (green) overlaps the licensed contour (thin green) and remains within 25 miles of primary station WWCO(AM) (grey circle) as illustrated in Figures 1 and 2.

74.1204 Study

The following facilities were considered:

Call Sign	C	ST	City	Freq.	ERP	Class	Status	D
WKSS	0	CT	HARTFORD-MERIDEN	95.7	16500.0	B	LIC	15.38
WHCN	1	CT	HARTFORD	105.9	16000.0	B	LIC	15.38
WBLI	1	NY	PATCHOGUE	106.1	49000.0	B	LIC	75.05
W292ES	1	NY	DOVER PLAINS	106.3	10.0	D	LIC	48.22
W292FI	3	CT	WATERBURY	106.3	200.0	D	LIC	5.66
Proposed	6	CT	WATERBURY	106.3	250.0	D	APP	0.00
WYMK	1	NY	MOUNT KISCO	106.3	980.0	A	LIC	66.33
WWKX	1	RI	WOONSOCKET	106.3	1150.0	A	LIC	141.00
WEIB	1	MA	NORTHAMPTON	106.3	3000.0	A	LIC	99.28
W293AU	1	CT	DERBY	106.5	250.0	D	LIC	14.33
WBMW	2	CT	PAWCATUCK	106.5	12500.0	B1	LIC	85.45
WCCC	1	CT	HARTFORD	106.9	23000.0	B	LIC	36.05
WWCO(AM)	2	CT	WATERBURY	1240.0	1000.0	C	LIC	5.66

Figures 1, 2, and 3 illustrate the absence of prohibited overlap between the proposed translator interfering contours and the pertinent service contours of all facilities except WCCC and WHCN. (Key: same colors may not overlap.)

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

As shown in Figure 2, WCCC places a 69 dBu service contour over the proposed site, and WHCN places a 77.5 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 109 dBu.

Interference Protection to All Nearby Residences, Businesses, and Roadways

The proposed translator facility will operate with an ERP of 0.25 kW (H&V.) For an ERP of 0.25 kW, the distance to the 109 dBu F(50,10) contour in free space is 394 meters.

The proposed antenna is an ERI 100A1-DA shielded by a 49 square foot screen with the center of radiation at 182 meters above ground. The antenna produces a vertical radiation pattern that prevents the 109 dBu F(50,10) interfering contour from reaching the ground within 394 meters of the antenna.

The closest residence is 162 meters distant (see Figure 4.). Based on the actual distance in space from the antenna center of radiation to each residence, the table in Figure 5 provides calculations of the interference protection to establish that the interfering contour does not reach the ground.

The antenna vertical pattern is illustrated in Figure 6. 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, a comparison with the actual antenna field, and the margin of safety in dB. As shown in Figure 5, the margin of safety is not less than 0.34 dB.

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 WCCC or WHCN. Should any actual interference occur, the applicant will take the required steps to eliminate it.

Environmental Considerations

No physical changes to the tower are proposed. 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,

Dennis Jackson
Technical Consultant
February 1, 2023

Figure 1 - 74.1204 Study

Proposed interfering contours do not overlap service contours of any other facility except for WCCC and WHCN.

Proposed Service Contour (green) lies within 25 miles of WWCO (grey circle) and overlaps licensed Service Contour (thin green) .(Key: Same colors may not overlap.)

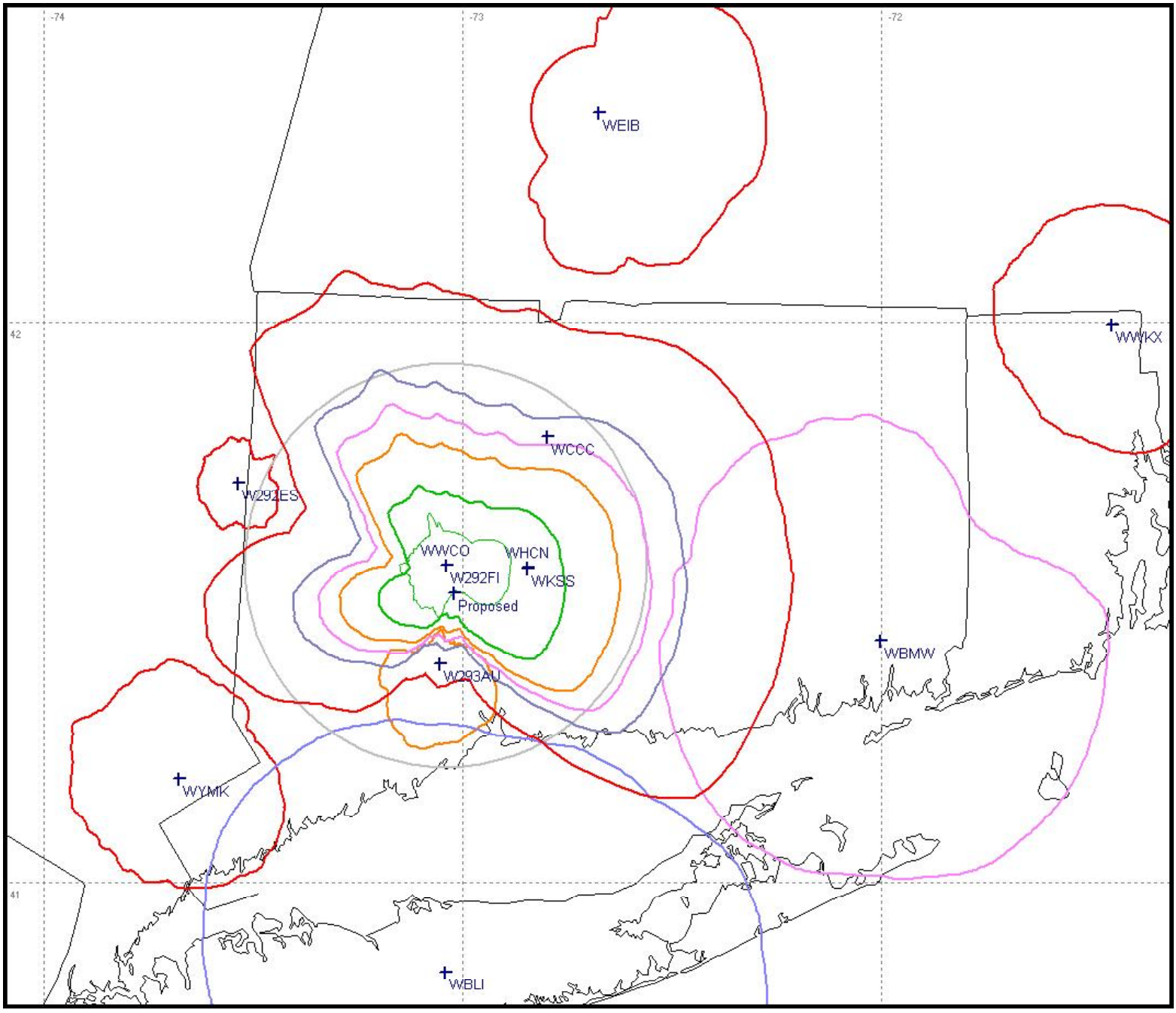

Figure 2 - 74.1204 Study

WCCC places a 69 dBu service contour over the site, and

WHCN places a 77.5 dBu contour over the site (both blue)

Proposed Service Contour (green) overlaps licensed Service Contour (thin green)

(Key: Same colors may not overlap.)

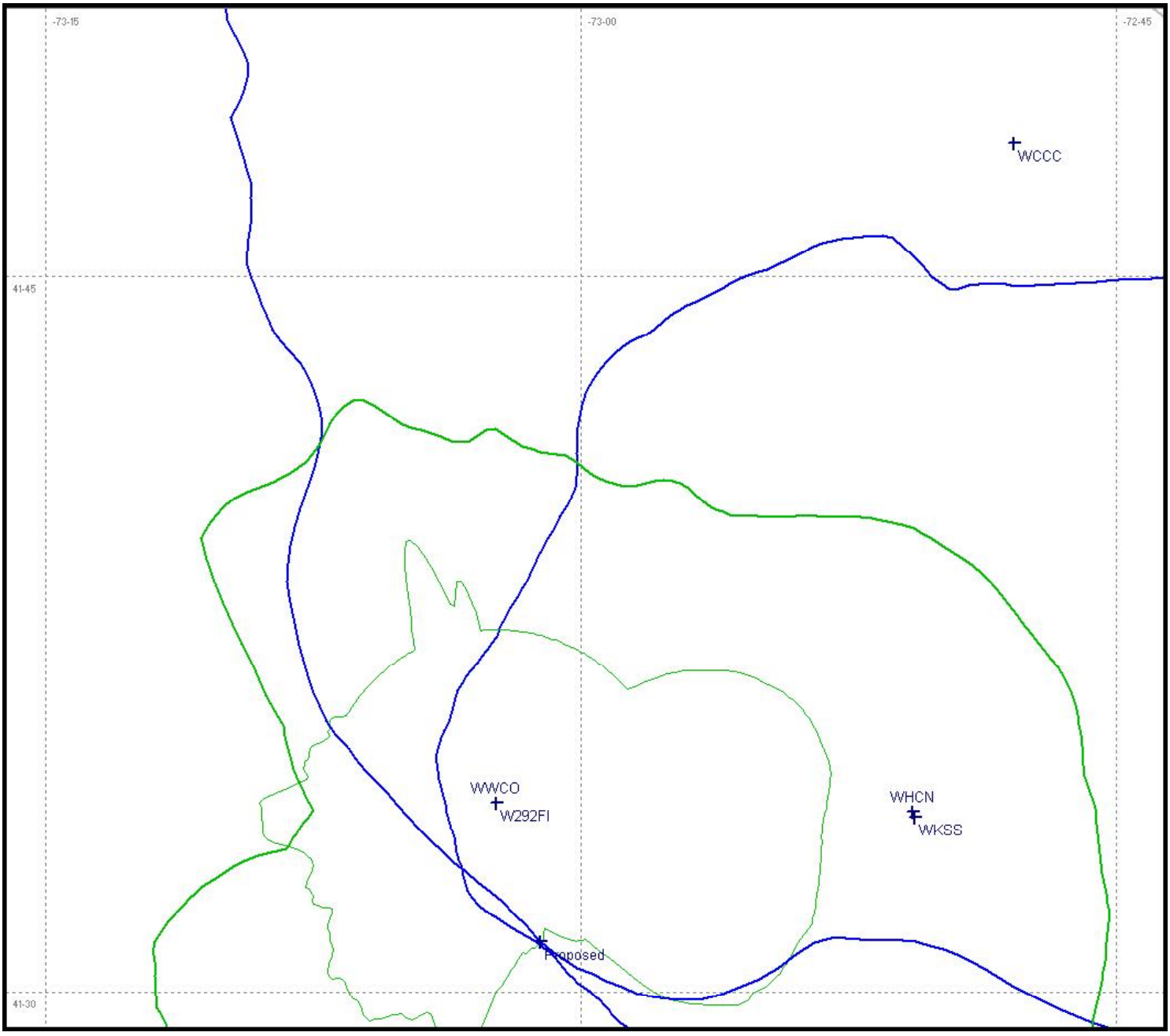

Figure 3 – <u>74.1204 Study - Closeup to W293AU</u>

Proposed 54 dBu Interfering Contour does not overlap

60 dBu Service Contour of first adjacent W293AU (both orange.)

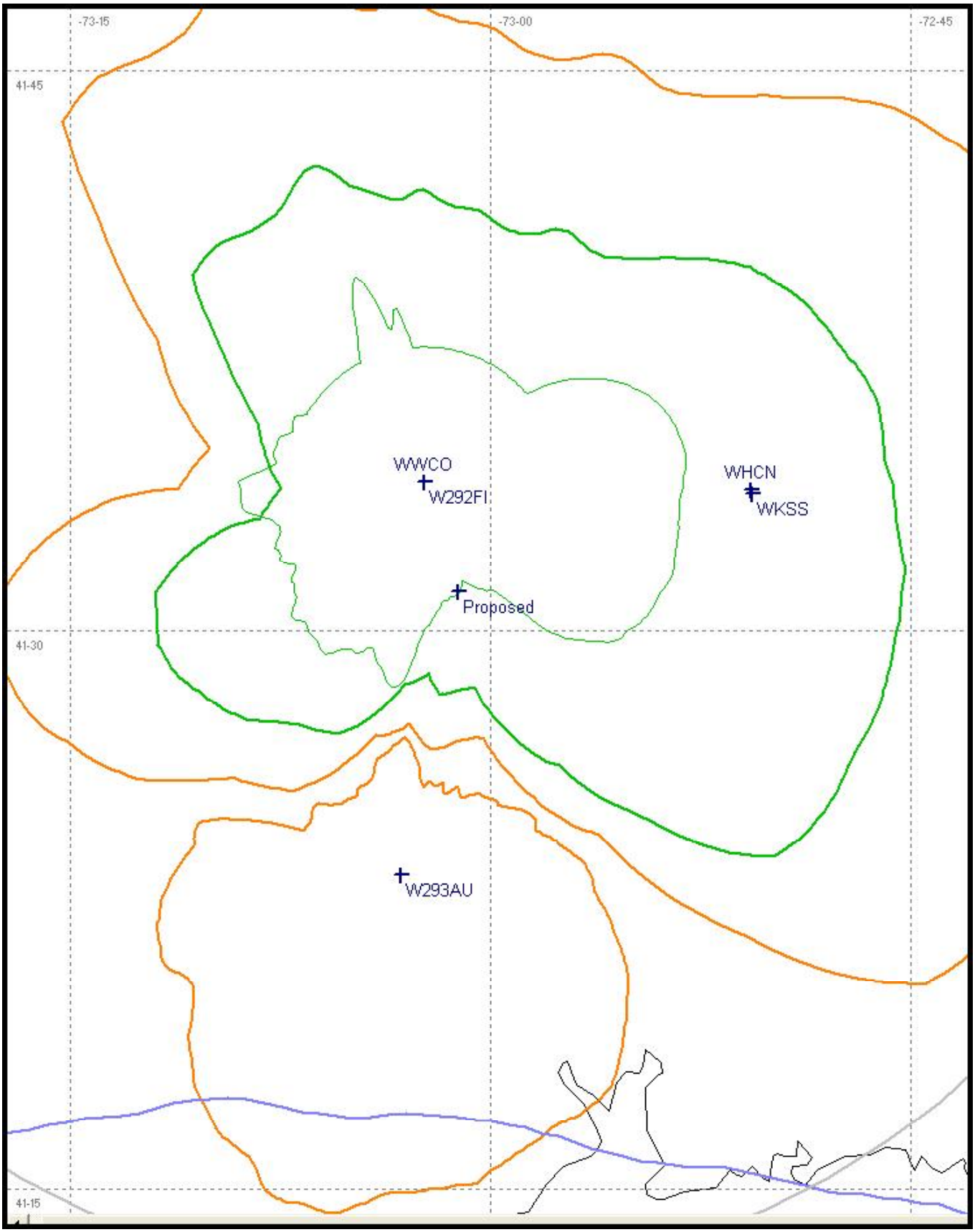

Figure 4

Nearest residence is 162 meters from the proposed antenna tower.

Nearby structures to the east are part of host tower complex.

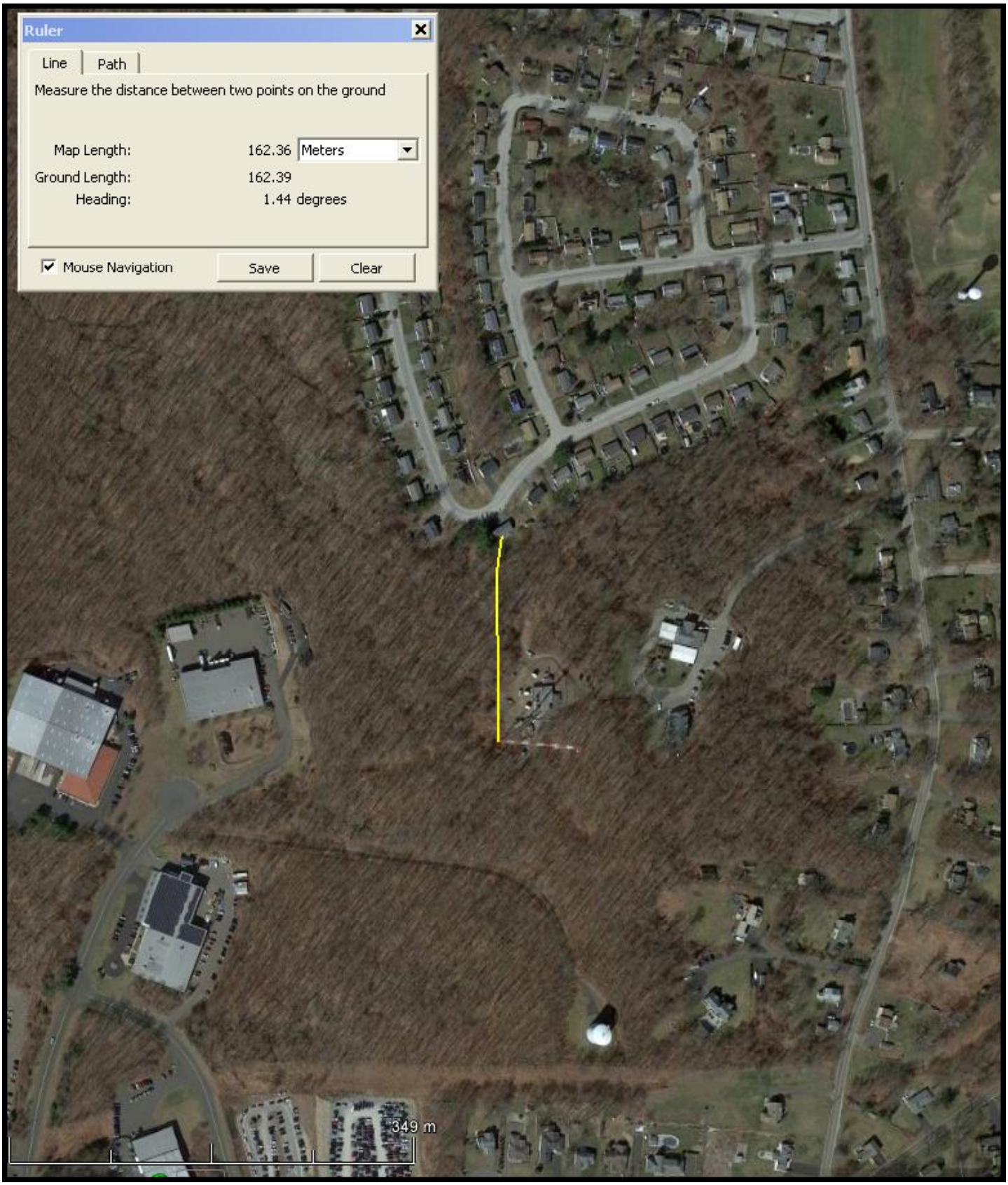

Figure 5

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 182 meters above ground level.**

2. **For each residence in the area, the following is shown:**

   - **A. Horizontal distance from antenna site to residence**
   - **B. Downward angle from antenna CR to ground**
   - **C. Actual distance in space from antenna to ground**
   - **D. ERP limit at which interfering contours extends to actual distance in space**
   - **E. Antenna field limit corresponsding to ERP limit**
   - **F. Antenna field at pertinent downward angle**
   - **G. Margin of safety in dB**

3. **Margin of Safety is at least 0..34 dB at any location within 394 meters of antenna.**

A	B	C	D	E	F	G
Horizontal Distance to Point (meters)	Downward Vertical Angle (degrees)	Actual Distance in Space (meters)	Power Limit (Watts)	Antenna Field Limit	Actual Antenna Field	Margin of Safety (dB)
150	50.5	235.8	90	0.600	0.530	1.08
175	46.1	252.5	102	0.639	0.598	0.57
200	42.3	270.4	118	0.687	0.656	0.40
206	41.5	274.9	122	0.699	0.668	0.39
212.5	40.6	279.8	127	0.713	0.685	0.34
219	39.7	284.8	130	0.721	0.693	0.35
225	39.0	289.4	135	0.735	0.706	0.35
237.5	37.5	299.2	144	0.759	0.726	0.39
250	36.1	309.2	154	0.785	0.744	0.46
275	33.5	329.8	176	0.839	0.777	0.67
300	31.2	350.9	198	0.890	0.804	0.88
325	29.2	372.5	225	0.949	0.827	1.19
350	27.5	394.5	250	1.000	0.846	1.45

Figure 6

ERI 100A-DA Vertical Radiation Profile

Vertical diagram at an azimuth of 0° degrees

Dep (°)	Er (%)	ERP (W)	Dep (°)	Er (%)	ERP (W)	Dep (°)	Er (%)	ERP (W)
0.0	100.0	373.6	60.0	39.1	57.2	120.0	31.5	37.0
1.0	100.0	373.5	61.0	37.6	52.8	121.0	32.0	38.3
2.0	100.0	373.4	62.0	36.1	48.6	122.0	32.6	39.6
3.0	99.9	373.3	63.0	34.5	44.6	123.0	33.1	41.0
4.0	99.9	373.1	64.0	32.9	40.5	124.0	33.6	42.2
5.0	99.9	372.9	65.0	31.3	36.6	125.0	34.1	43.5
6.0	99.9	372.8	66.0	29.7	33.0	126.0	34.6	44.7
7.0	99.5	369.9	67.0	28.2	29.8	127.0	35.2	46.2
8.0	99.1	367.0	68.0	26.8	26.8	128.0	35.7	47.6
9.0	98.7	364.1	69.0	25.3	23.9	129.0	36.2	49.1
10.0	98.2	360.5	70.0	23.9	21.3	130.0	36.7	50.3
11.0	97.7	356.9	71.0	22.5	18.9	131.0	37.1	51.5
12.0	97.2	353.3	72.0	21.1	16.6	132.0	37.6	52.7
13.0	96.6	348.9	73.0	19.9	14.8	133.0	38.1	54.1
14.0	96.0	344.5	74.0	18.8	13.2	134.0	38.6	55.6
15.0	95.4	340.1	75.0	17.6	11.6	135.0	39.1	57.0
16.0	94.7	335.4	76.0	16.6	10.2	136.0	39.5	58.4
17.0	94.1	330.8	77.0	15.5	9.0	137.0	40.0	59.7
18.0	93.4	326.1	78.0	14.5	7.8	138.0	40.4	61.1
19.0	92.6	320.4	79.0	13.7	7.0	139.0	40.9	62.5
20.0	91.8	314.7	80.0	12.9	6.2	140.0	41.4	63.9
21.0	91.0	309.1	81.0	12.0	5.4	141.0	41.8	65.3
22.0	90.0	302.7	82.0	11.5	5.0	142.0	42.2	66.5
23.0	89.1	296.5	83.0	11.0	4.5	143.0	42.6	67.8
24.0	88.1	290.3	84.0	10.5	4.1	144.0	43.0	69.0
25.0	87.2	283.8	85.0	10.3	4.0	145.0	43.4	70.3
26.0	86.2	277.4	86.0	10.2	3.9	146.0	43.8	71.6
27.0	85.2	271.1	87.0	10.0	3.7	147.0	44.1	72.8
28.0	84.0	263.9	88.0	10.2	3.9	148.0	44.7	74.7
29.0	82.9	256.8	89.0	10.4	4.0	149.0	45.3	76.5
30.0	81.8	249.8	90.0	10.5	4.1	150.0	45.8	78.4
31.0	80.6	242.9	91.0	11.4	4.8	151.0	46.4	80.3
32.0	79.5	236.1	92.0	12.0	5.4	152.0	46.9	82.3
33.0	78.3	229.3	93.0	12.7	6.0	153.0	47.5	84.3
34.0	77.1	222.0	94.0	13.4	6.7	154.0	48.0	86.2
35.0	75.8	214.7	95.0	14.1	7.4	155.0	48.6	88.2
36.0	74.5	207.6	96.0	14.8	8.2	156.0	49.1	90.2
37.0	73.2	200.4	97.0	15.6	9.1	157.0	49.5	91.5
38.0	71.9	193.3	98.0	16.4	10.0	158.0	49.8	92.8
39.0	70.6	186.3	99.0	17.1	11.0	159.0	50.2	94.1
40.0	69.1	178.6	100.0	17.9	11.9	160.0	50.5	95.4
41.0	67.6	170.9	101.0	18.6	12.9	161.0	50.9	96.8
42.0	66.1	163.5	102.0	19.3	13.9	162.0	51.2	98.1
43.0	64.6	156.0	103.0	20.1	15.0	163.0	51.5	99.2
44.0	63.1	148.7	104.0	20.8	16.2	164.0	51.8	100.4
45.0	61.6	141.6	105.0	21.5	17.3	165.0	52.1	101.6
46.0	60.0	134.4	106.0	22.3	18.5	166.0	52.4	102.7
47.0	58.4	127.5	107.0	23.0	19.7	167.0	52.7	103.7
48.0	56.8	120.7	108.0	23.7	21.0	168.0	53.0	104.8
49.0	55.3	114.4	109.0	24.4	22.2	169.0	53.2	105.7
50.0	53.8	108.2	110.0	25.1	23.5	170.0	53.4	106.5
51.0	52.3	102.2	111.0	25.7	24.8	171.0	53.6	107.4
52.0	50.8	96.6	112.0	26.5	26.2	172.0	53.9	108.4
53.0	49.4	91.1	113.0	27.2	27.6	173.0	54.1	109.4
54.0	47.9	85.8	114.0	27.9	29.0	174.0	54.4	110.5
55.0	46.5	80.7	115.0	28.5	30.4	175.0	54.7	111.9
56.0	45.0	75.7	116.0	29.2	31.8	176.0	55.1	113.3
57.0	43.6	71.0	117.0	29.8	33.1	177.0	55.4	114.7
58.0	42.1	66.2	118.0	30.4	34.4	178.0	55.7	115.9
59.0	40.6	61.6	119.0	30.9	35.7	179.0	56.0	117.0