

## Proposed Site Change for W280FX at Norwalk, Connecticut

Facility ID 202426      File No. BNPFT-20180501ABN

### Technical Statement

#### Summary

This application proposes a relocation of W280FX to the east tower of co-owned primary station WNLK(AM) at Norwalk, CT.

The 60 dBu service contour of the proposed amended facility overlaps that of the presently authorized facility (both green), and remains lies entirely within 25 miles of the AM site (gray circle), as illustrated in Figure 1 below.

#### Section 74.1204 Study

The following facilities were studied.

Call Sign	C	ST	City	Freq.	ERP	Class	Status	D
Proposed	6	CT	NORWALK	103.9	250.0	A	APP	0.00
WNLK(AM)	0	CT	NORWALK	1350.0	1000.0	A	LIC	0.03
W280FX CP	2	CT	NORWALK	103.9	100.0	D	CP	3.98
W279CI	1	CT	DANBURY	103.7	250.0	D	LIC	28.79
WNBM	2	NY	BRONXVILLE	103.9	980.0	A	LIC	45.51
WAXQ	1	NY	NEW YORK	104.3	6000.0	B	LIC	61.77
WKTU	1	NY	LAKE SUCCESS	103.5	6000.0	B	LIC	61.77
WRCN-FM	1	NY	RIVERHEAD	103.9	1400.0	A	LIC	63.45
WMRQ-FM	2	CT	WATERBURY	104.1	14000.0	B	LIC	69.99

Figure 1 illustrates the absence of prohibited overlap between the proposed modified translator F(50,10) interfering contours and the pertinent service contours of all facilities listed above except WKTU and WAXQ (Key: same colors may not overlap.)

As shown in Figure 1, the proposed translator interfering contour lies inside the protected service contours of WKTU and WAXQ, which are co-located. Therefore, the applicant respectfully requests a waiver pursuant to 74.1204(d) as described below.

Also as illustrated in Figure 1, the signal level from both WKTU and WAXQ at the proposed translator site is 55.5 dBu. 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 95.5 dBu.

## **Protection to WKTU and WAXQ**

The proposed translator facility will operate with an ERP of 0.25 kW. As seen in Figure 2, the nearest residence to the proposed antenna site is 69 meters from the tower base. For 0.25 kW ERP the 95.5 dBu F(50,10) interfering contour extends 1,862 meters in free space.

The applicant will employ a phased antenna array to protect the entire area that lies at distances between 69 and 1,862 meters from the proposed site from receiving an interfering signal level that could equal or exceed 95.5 dBu F(50,10). That is to say, the interfering signal will not reach the ground at any point.

The proposed antenna design is comprised of eight Label Italy AKG-1/N vertical dipoles in a phased array centered 51 meters above ground level on the WNLK(AM) east tower and oriented at 330 degrees True. The relative spacing, magnitude, and phase of the power fed to each bay is shown in Figure 3.

The array produces the elevation pattern graphed in Figure 4. The red curve shown indicates the maximum allowed field limits at all pertinent vertical angles in order that the 95.5 dBu F(50,10) interfering contour not reach the ground for an ERP of 0.25 kW. The blue curve illustrates the field produced by the antenna array. As shown, the field from the proposed array remains below the maximum allowable limit at all points. A detailed tabulation at increments of 0.1 degree of the elevation pattern produced by the array is provided in the Appendix.

Figure 5 illustrates interference protection by showing the downward or depression angle to points on the ground at distances between 69 meters and 1,862 meters together with the actual distance in space (hypotenuse of a right triangle) to each point, the field and ERP produced by the antenna array at the pertinent downward angle, the distance to the 95.5 dBu F(50,10) interfering contour, and the margin of safety dB between the interfering contour and the allowable maximum.

It might be noted that whereas the tabulations and figures presented herein assume an ERP of 0.25 kW, the horizontal field of the directional antenna is such that the ERP is less than 0.25 kW along most azimuths, including in the direction of the nearest residence.

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 WKTU or WAXQ. Nevertheless, as required by the Commission’s Rules, in the event of any complaints that the proposed translator interferes with reception of either station, the applicant will take the required steps to eliminate the interference, including, if necessary, reducing power or cessation of translator operation.

### **Environmental Considerations**

The proposed antenna will be mounted on an existing tower with no new construction or change in height. Compliance with RFR limits was determined by use of the Commission's RF Worksheet #1.

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 Appendix A.

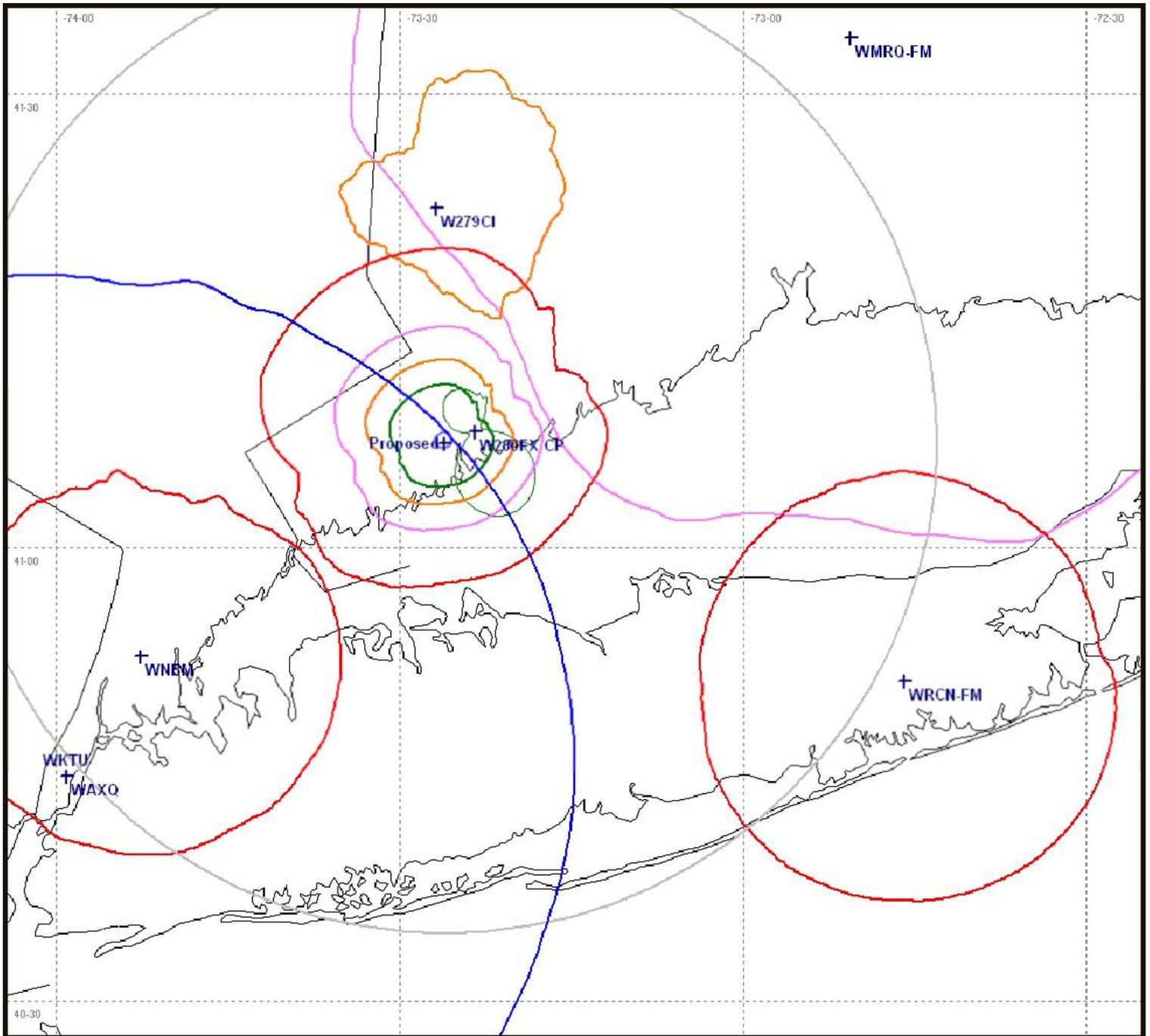
Respectfully submitted,

A handwritten signature in black ink, appearing to read 'D. Jackson', written over a light gray rectangular background.

Dennis Jackson  
Technical Consultant  
March 14, 2021

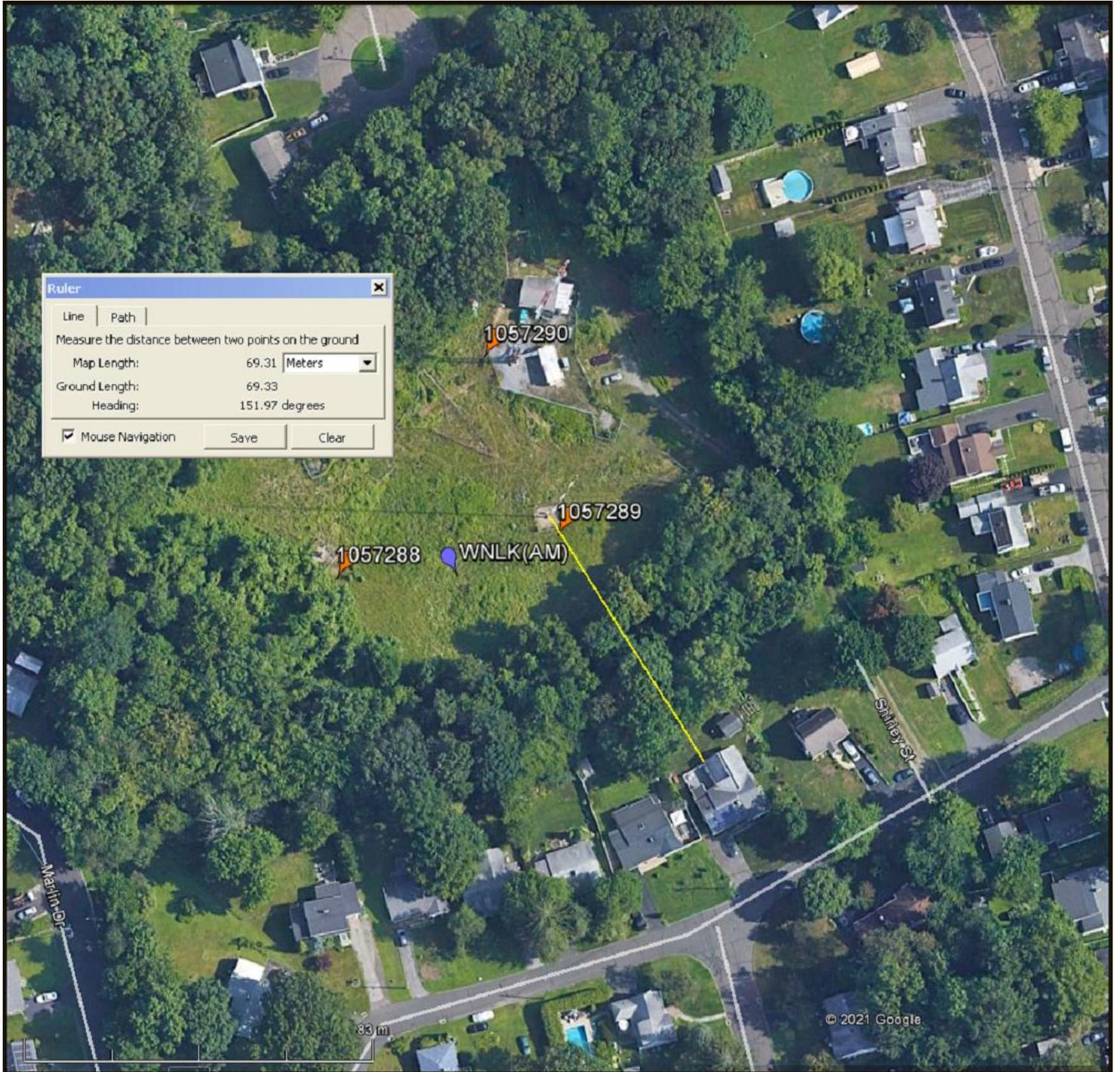
**Figure 1 – Section 74.1204 Study**

**No prohibited overlap is created. (Key: Same colors may not overlap.)**  
**Proposed service contour overlaps that of authorized facility (both green)**  
**and remains within 25 miles of primary station WNLK(AM) (gray.)**  
**WKTU and WAXQ both place 55.5 dBu service contours to the proposed site (blue.)**



**Figure 2 – Antenna Vicinity**

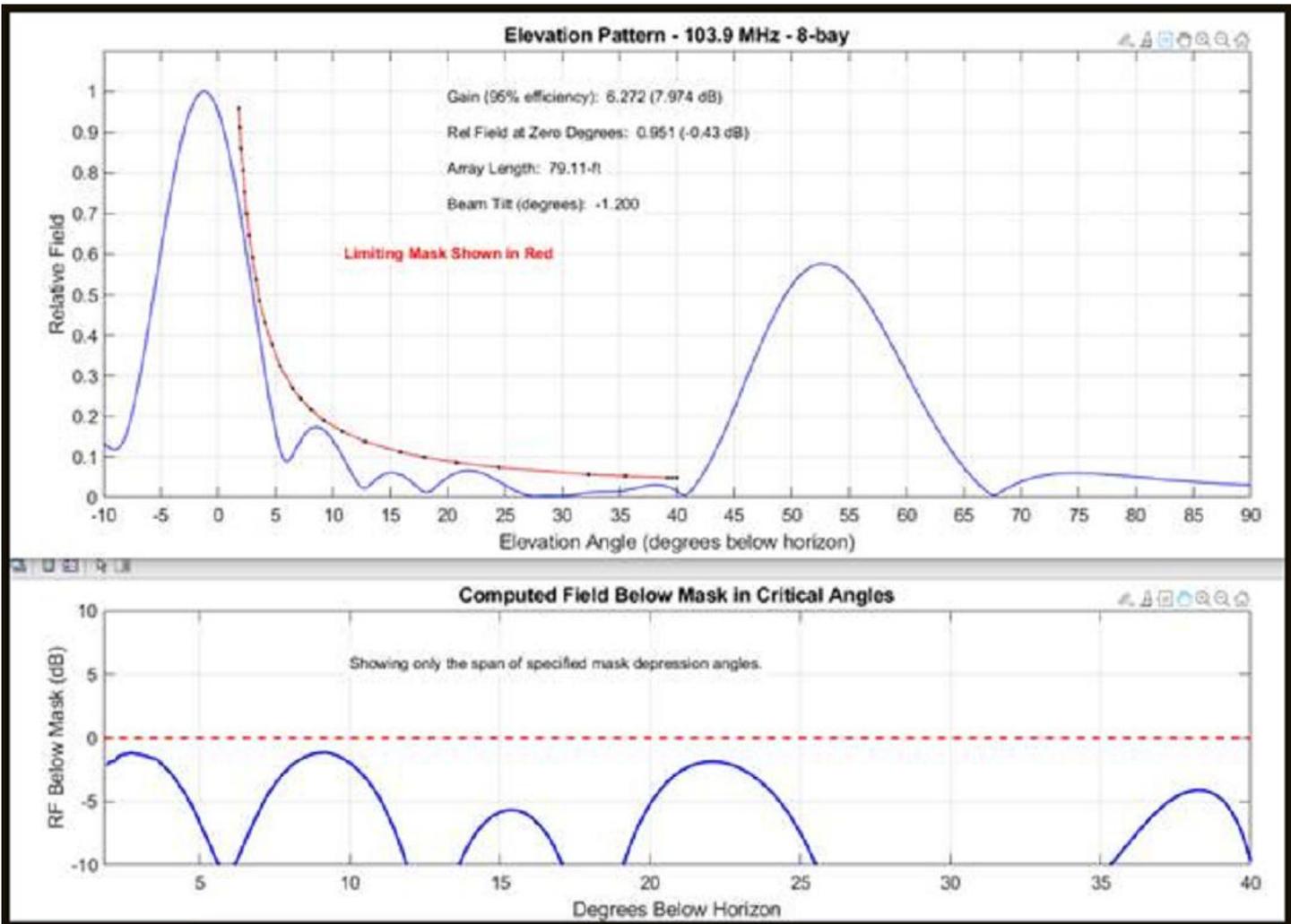
**Nearest residence is 69 meters from proposed antenna site on WNLK(AM) east tower**



**Figure 3 – Antenna Array Parameters**

Bay # From Top	1	2	3	4	5	6	7	8
Relative Phase (deg)	-64.796	-54.775	-44.359	-31.257	-26.27	-14.007	-9.147	0
Relative Magnitude (V)	0.447	0.892	1.000	0.989	0.892	0.881	0.794	0.501
Equal spacing at 134-inches (1.1796 wavelength)								

**Figure 4 – Antenna Array Elevation Pattern**



**Figure 5**

**Clearance from 95.5 dBu F(50,10) Interfering Contour to Ground  
at distances from 69 meters to 1,862 meters from antenna site,  
expressed as a margin of safety in dB.**

**Antenna HAGL = 57 meters**

<b>Horizontal Distance to Point (meters)</b>	<b>Downward Vertical Angle (degrees)</b>	<b>Actual Distance in Space (meters)</b>	<b>Power Limit (Watts)</b>	<b>Antenna Field Limit</b>	<b>Actual Antenna Field</b>	<b>Margin of Safety (dB)</b>
69	36.5	85.8	0.53	0.046	0.023	6.03
70	36.1	86.6	0.54	0.046	0.012	11.76
85	31.0	99.1	0.70	0.053	0.022	7.62
100	27.0	112.3	0.90	0.060	0.046	2.31
125	22.2	135.0	1.32	0.073	0.017	12.62
150	18.8	158.4	1.81	0.085	0.006	23.03
175	16.2	182.3	2.40	0.098	0.057	4.71
200	14.3	206.4	3.03	0.110	0.057	5.72
250	11.5	255.1	4.70	0.137	0.052	8.42
300	9.6	304.3	6.68	0.163	0.146	0.98
325	8.9	329.0	7.80	0.177	0.164	0.64
350	8.3	353.7	9.00	0.190	0.167	1.11
400	7.3	403.2	11.7	0.216	0.140	3.78
450	6.5	452.9	14.8	0.243	0.090	8.64
500	5.8	502.6	18.2	0.270	0.055	13.81
600	4.9	602.2	26.1	0.323	0.145	6.96
700	4.2	701.9	35.5	0.377	0.260	3.22
800	3.6	801.6	46.4	0.431	0.370	1.32
850	3.4	851.5	52.3	0.457	0.408	0.99
875	3.3	876.5	55.4	0.471	0.427	0.85
900	3.2	901.4	58.6	0.484	0.447	0.69
950	3.1	951.4	65.2	0.511	0.466	0.80
975	3.0	976.3	68.7	0.524	0.485	0.68
1000	2.9	1001.3	72.3	0.538	0.504	0.56
1050	2.8	1051.2	79.7	0.565	0.523	0.67
1100	2.7	1101.2	87.4	0.591	0.542	0.76
1200	2.4	1201.1	104.0	0.645	0.599	0.64
1300	2.2	1301.0	122.1	0.699	0.636	0.82
1400	2.1	1400.9	141.6	0.753	0.654	1.22
1500	1.9	1500.9	162.5	0.806	0.689	1.36
1600	1.8	1600.8	184.8	0.860	0.707	1.70
1700	1.7	1700.8	208.0	0.912	0.724	2.01
1800	1.6	1800.7	234.0	0.967	0.740	2.33
1862	1.6	1862.7	250.0	1.000	0.740	2.62

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**Antenna Array Elevation Pattern Tabulation**

**At Downward Angles between 1.6 degrees (1,862 meters from antenna)**

**To 36.5 degrees (corresponds to 69 meters from antenna)**

<b>Downward Angle (Deg)</b>	<b>Field</b>						
0.0	0.946	4.8	0.160	9.6	0.146	14.4	0.059
0.1	0.937	4.9	0.145	9.7	0.142	14.5	0.060
0.2	0.928	5.0	0.130	9.8	0.138	14.6	0.061
0.3	0.918	5.1	0.116	9.9	0.134	14.7	0.062
0.4	0.907	5.2	0.103	10.0	0.130	14.8	0.063
0.5	0.896	5.3	0.091	10.1	0.125	14.9	0.064
0.6	0.885	5.4	0.080	10.2	0.121	15.0	0.064
0.7	0.872	5.5	0.071	10.3	0.116	15.1	0.064
0.8	0.860	5.6	0.063	10.4	0.111	15.2	0.064
0.9	0.846	5.7	0.058	10.5	0.106	15.3	0.064
1.0	0.832	5.8	0.055	10.6	0.101	15.4	0.064
1.1	0.818	5.9	0.056	10.7	0.096	15.5	0.064
1.2	0.803	6.0	0.058	10.8	0.090	15.6	0.063
1.3	0.788	6.1	0.063	10.9	0.085	15.7	0.062
1.4	0.773	6.2	0.069	11.0	0.080	15.8	0.062
1.5	0.757	6.3	0.076	11.1	0.074	15.9	0.061
1.6	0.740	6.4	0.083	11.2	0.069	16.0	0.060
1.7	0.724	6.5	0.090	11.3	0.063	16.1	0.058
1.8	0.707	6.6	0.097	11.4	0.058	16.2	0.057
1.9	0.689	6.7	0.104	11.5	0.052	16.3	0.056
2.0	0.672	6.8	0.111	11.6	0.047	16.4	0.054
2.1	0.654	6.9	0.117	11.7	0.041	16.5	0.052
2.2	0.636	7.0	0.123	11.8	0.036	16.6	0.051
2.3	0.617	7.1	0.129	11.9	0.031	16.7	0.049
2.4	0.599	7.2	0.135	12.0	0.026	16.8	0.047
2.5	0.580	7.3	0.140	12.1	0.021	16.9	0.045
2.6	0.561	7.4	0.144	12.2	0.016	17.0	0.043
2.7	0.542	7.5	0.148	12.3	0.011	17.1	0.041
2.8	0.523	7.6	0.152	12.4	0.007	17.2	0.039
2.9	0.504	7.7	0.155	12.5	0.004	17.3	0.037
3.0	0.485	7.8	0.158	12.6	0.005	17.4	0.035
3.1	0.466	7.9	0.161	12.7	0.009	17.5	0.033
3.2	0.447	8.0	0.163	12.8	0.013	17.6	0.030
3.3	0.427	8.1	0.164	12.9	0.017	17.7	0.028
3.4	0.408	8.2	0.166	13.0	0.021	17.8	0.026
3.5	0.389	8.3	0.167	13.1	0.025	17.9	0.024
3.6	0.370	8.4	0.167	13.2	0.029	18.0	0.022
3.7	0.351	8.5	0.167	13.3	0.032	18.1	0.020
3.8	0.333	8.6	0.167	13.4	0.036	18.2	0.017
3.9	0.314	8.7	0.166	13.5	0.039	18.3	0.015
4.0	0.296	8.8	0.165	13.6	0.042	18.4	0.013
4.1	0.278	8.9	0.164	13.7	0.045	18.5	0.011
4.2	0.260	9.0	0.162	13.8	0.047	18.6	0.009
4.3	0.242	9.1	0.160	13.9	0.050	18.7	0.008
4.4	0.225	9.2	0.158	14.0	0.052	18.8	0.006
4.5	0.208	9.3	0.155	14.1	0.054	18.9	0.004
4.6	0.192	9.4	0.152	14.2	0.056	19.0	0.003
4.7	0.175	9.5	0.149	14.3	0.057	19.1	0.003

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**Antenna Array Elevation Pattern Tabulation**

At Downward Angles between 1.6 degrees (1,862 meters from antenna)

<b>Downward Angle (Deg)</b>	<b>Field</b>						
19.2	0.003	24.0	0.030	28.8	0.023	33.6	0.040
19.3	0.004	24.1	0.031	28.9	0.021	33.7	0.040
19.4	0.006	24.2	0.032	29.0	0.019	33.8	0.039
19.5	0.007	24.3	0.033	29.1	0.017	33.9	0.038
19.6	0.008	24.4	0.034	29.2	0.015	34.0	0.037
19.7	0.009	24.5	0.036	29.3	0.013	34.1	0.036
19.8	0.010	24.6	0.037	29.4	0.011	34.2	0.035
19.9	0.012	24.7	0.038	29.5	0.009	34.3	0.034
20.0	0.012	24.8	0.039	29.6	0.007	34.4	0.032
20.1	0.013	24.9	0.040	29.7	0.005	34.5	0.031
20.2	0.014	25.0	0.041	29.8	0.004	34.6	0.029
20.3	0.015	25.1	0.042	29.9	0.003	34.7	0.027
20.4	0.015	25.2	0.043	30.0	0.003	34.8	0.026
20.5	0.016	25.3	0.044	30.1	0.005	34.9	0.024
20.6	0.016	25.4	0.044	30.2	0.007	35.0	0.022
20.7	0.017	25.5	0.045	30.3	0.009	35.1	0.020
20.8	0.017	25.6	0.046	30.4	0.011	35.2	0.018
20.9	0.017	25.7	0.046	30.5	0.012	35.3	0.016
21.0	0.018	25.8	0.047	30.6	0.014	35.4	0.014
21.1	0.018	25.9	0.047	30.7	0.016	35.5	0.012
21.2	0.018	26.0	0.047	30.8	0.018	35.6	0.010
21.3	0.018	26.1	0.048	30.9	0.020	35.7	0.009
21.4	0.018	26.2	0.048	31.0	0.022	35.8	0.009
21.5	0.018	26.3	0.048	31.1	0.024	35.9	0.009
21.6	0.017	26.4	0.048	31.2	0.025	36.0	0.010
21.7	0.017	26.5	0.048	31.3	0.027	36.1	0.012
21.8	0.017	26.6	0.047	31.4	0.028	36.2	0.015
21.9	0.017	26.7	0.047	31.5	0.030	36.3	0.017
22.0	0.017	26.8	0.047	31.6	0.031	36.4	0.020
22.1	0.017	26.9	0.046	31.7	0.033	36.5	0.023
22.2	0.017	27.0	0.046	31.8	0.034	36.6	0.026
22.3	0.017	27.1	0.045	31.9	0.035	36.7	0.029
22.4	0.017	27.2	0.044	32.0	0.036	36.8	0.032
22.5	0.017	27.3	0.044	32.1	0.037	36.9	0.035
22.6	0.017	27.4	0.043	32.2	0.038	37.0	0.038
22.7	0.017	27.5	0.042	32.3	0.039	37.1	0.041
22.8	0.018	27.6	0.041	32.4	0.040	37.2	0.044
22.9	0.018	27.7	0.040	32.5	0.040	37.3	0.047
23.0	0.019	27.8	0.038	32.6	0.041	37.4	0.051
23.1	0.020	27.9	0.037	32.7	0.041	37.5	0.054
23.2	0.021	28.0	0.036	32.8	0.042	37.6	0.057
23.3	0.022	28.1	0.034	32.9	0.042	37.7	0.060
23.4	0.023	28.2	0.033	33.0	0.042	37.8	0.063
23.5	0.024	28.3	0.031	33.1	0.042	37.9	0.067
23.6	0.025	28.4	0.030	33.2	0.042	38.0	0.070
23.7	0.026	28.5	0.028	33.3	0.042	38.1	0.073
23.8	0.027	28.6	0.026	33.4	0.041	38.2	0.076
23.9	0.028	28.7	0.024	33.5	0.041	38.3	0.079