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**ENGINEERING REPORT**

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**Hauppauge, NY, Channel 296D FM Translator Application**

**ENGINEERING STATEMENT**

Applicant submits this technical minor change to K243DM, Hauppauge, NY. This filing includes a site change with a channel displacement from 243 to 296. The displacement from channel 243 to I.F. channel 296 is deemed a minor change pursuant to Section 74.1233(a) of the FCC Rules.

Figure EEA, attached, is a map showing overlap between the licensed and proposed 60 dBu F50,50 contours.

All required protections are met by contour non-overlap pursuant to Section 74.1204, with the exception of protection to WLTW, New York, NY, 294B. WLTW is protected, as discussed below.

**PROTECTION TO WLTW**

WLTW is a second adjacent-channel station to the proposed channel 296D facility. The 54 dBu F50,50 service contour of WLTW extends slightly beyond the proposed 296D transmitter site. Using the well-established *Living Way Ministries* Methodology, no actual interference to any population is predicted to exist to WLTW.

Note that a rule waiver of Section 74.1204 for this second/third adjacent-channel protection using the well-established *Living Way Ministries* Methodology is respectfully requested if such a rule waiver is deemed necessary for protection to any station.

The F50,50 signal strength from WLTW at the proposed 296D transmitter site is 54 dBu (the "desired" signal). The second/third adjacent-channel protection of Section 74.1204 is an undesired-to-desired ("U/D") dB signal strength ratio of 40:1. Therefore, predicted interference to WLTW from the proposed 296D facility is a signal of greater than or equal to 94 dBu.

Figure EE1 is the vertical plane relative field pattern for the proposed Scala CL-FM four-bay halfwave spaced antenna. By adjusting for the vertical plane downward relative field values of the proposed antenna, it is herein demonstrated that the 94 dBu

interfering signal (using a free space field determination) does not exist at any point a ground level. (Actually, the study is made to 2 meters above ground level to account for a person's height.)

Attached as Figure EE2 is a tabulation of various points (at 2 meters above ground level) from the proposed translator tower base. (Column B is the different distances from the tower base to each studied point.) The actual distance from the antenna to each point is listed in Column C, the hypotenuse of the vertical height (Column A) and the horizontal distance (Column B). Also, the vertical distance from the antenna bottom to the calculated interference signal for each studied point is provided in Column K. Because the calculated distance to the free space interfering signal (Column J) is less than the hypotenuse distance (Column C) and the interfering signal vertical distance (Column K) is less than the vertical distance (Column A) for each studied point, the interfering signal does not reach any studied point. (In other words, the interfering signal does not make it to 2 meters any point.) The clearance is at least 10 meters. Therefore, pursuant to Section 74.1204(d) of the FCC Rules, WLTW is adequately protected by the proposed facility.

Attached, is an aerial photo of the proposed transmitter site. There are no homes or other residences located within 831 meters of the proposed site that are deemed more than three stories tall. Therefore, the clearance shown on Figure EE2 (at least 10 meters) provides clearance to all locations within 831 meters – the worst case distance for the proposed 35 watt ERP facility. All roads are also protected based on the 10 meters worst-case clearance.

**FIGURE EE-A: Map Showing Licensed and Proposed Contour Overlap**

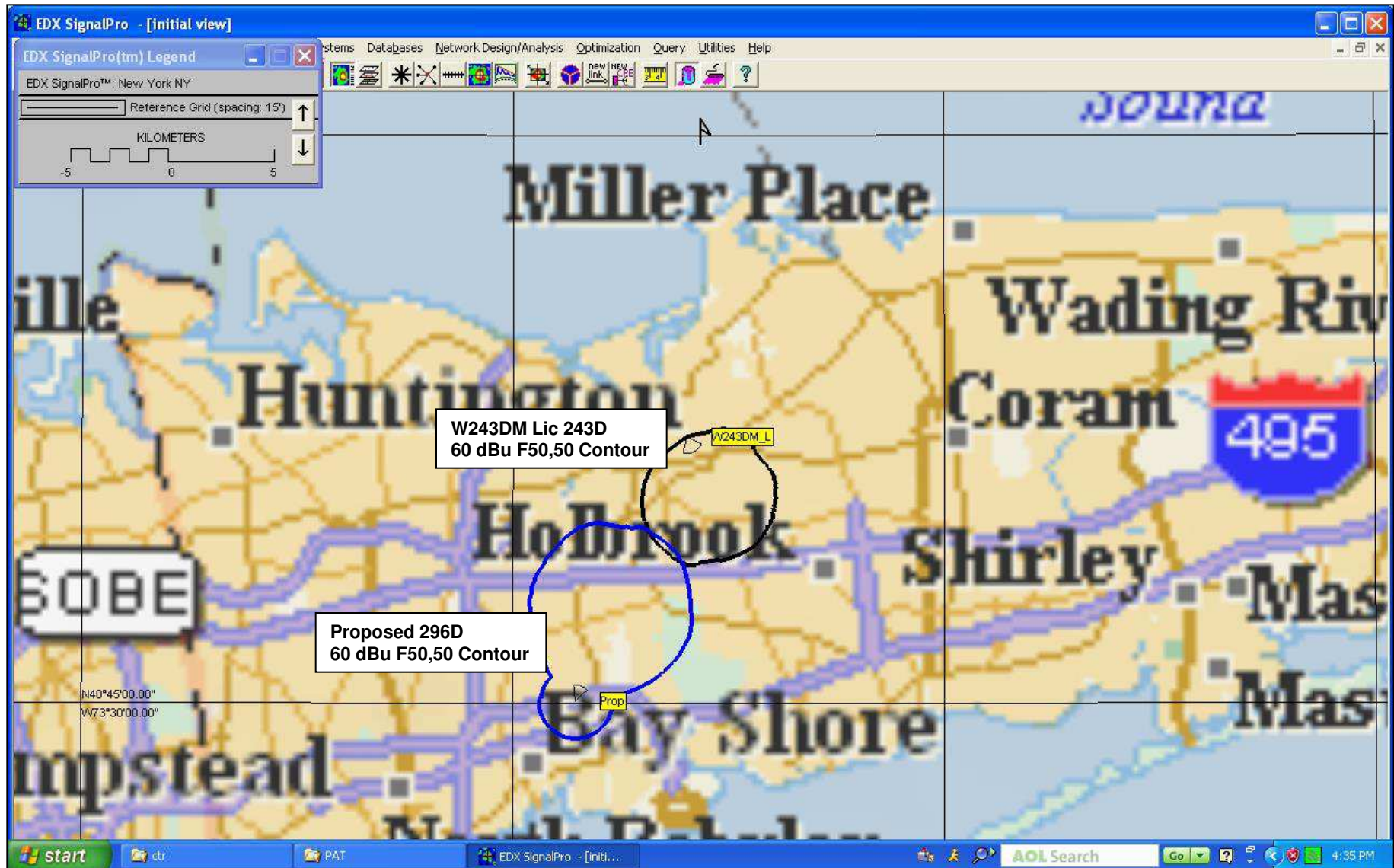


FIGURE EE1 (1 of 3)

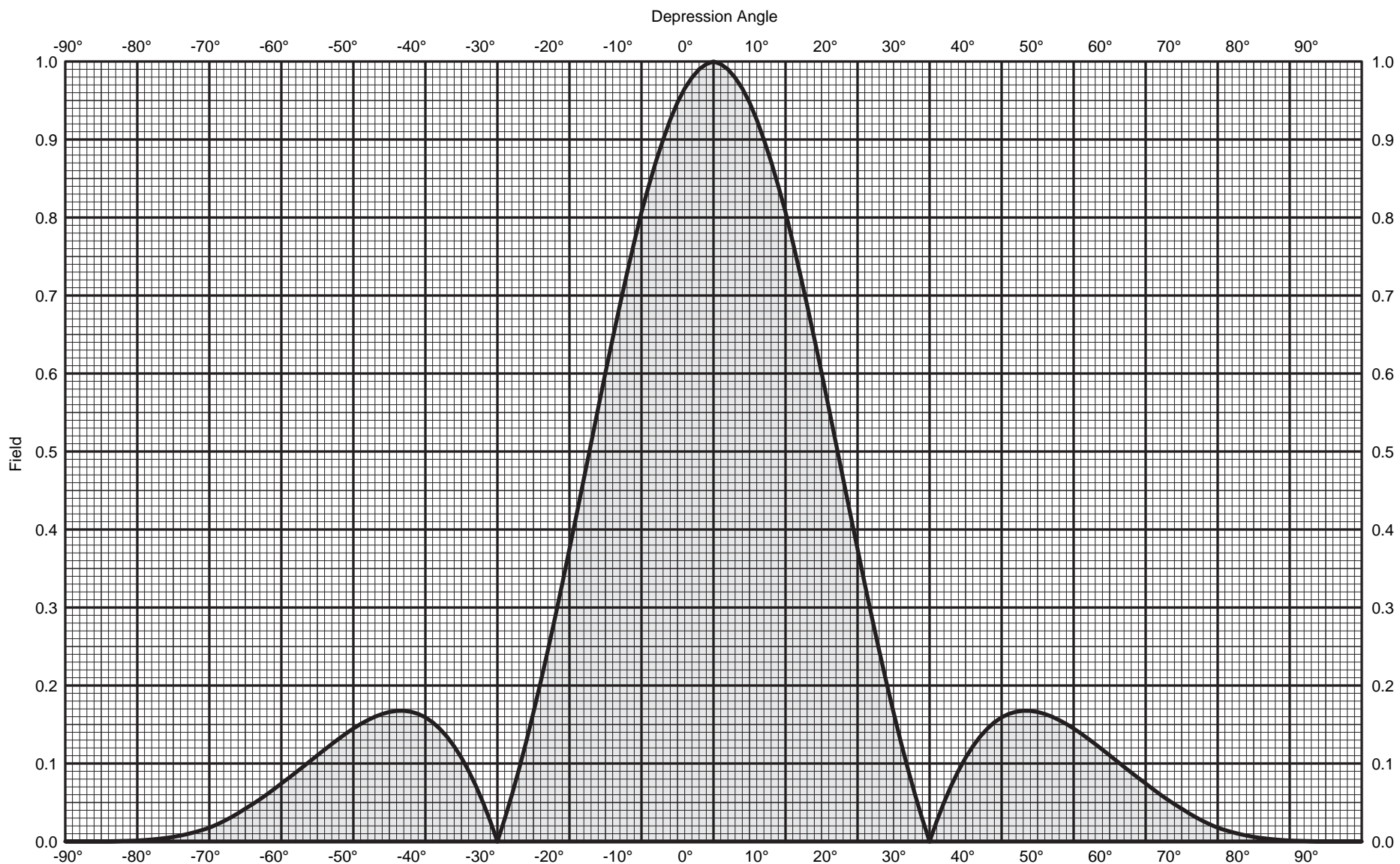




FIGURE EE1 (2 of 3)

Three bay CL-FM/HRM/50N Array

Frequency: 107.1 MHz

Gain: 12.0 dBd (x 15.8)

Horizontal Polarization

Vertical stacked 0.5 wavelength

Vertical plane Pattern

Angle	Field	Rel.dB	dBd	PwrMult	Angle	Field	Rel.dB	dBd	PwrMult
-90	0.010	-40.00	-28.00	0.00	-45	0.166	-15.59	-3.59	0.44
-89	0.010	-40.00	-28.00	0.00	-44	0.167	-15.52	-3.52	0.44
-88	0.010	-40.00	-28.00	0.00	-43	0.168	-15.52	-3.52	0.44
-87	0.010	-40.00	-28.00	0.00	-42	0.166	-15.58	-3.58	0.44
-86	0.010	-40.00	-28.00	0.00	-41	0.164	-15.72	-3.72	0.42
-85	0.010	-40.00	-28.00	0.00	-40	0.159	-15.96	-3.96	0.40
-84	0.010	-40.00	-28.00	0.00	-39	0.153	-16.31	-4.31	0.37
-83	0.010	-40.00	-28.00	0.00	-38	0.144	-16.81	-4.81	0.33
-82	0.010	-40.00	-28.00	0.00	-37	0.134	-17.44	-5.44	0.29
-81	0.010	-40.00	-28.00	0.00	-36	0.122	-18.28	-6.28	0.24
-80	0.010	-40.00	-28.00	0.00	-35	0.107	-19.38	-7.38	0.18
-79	0.010	-40.00	-28.00	0.00	-34	0.091	-20.86	-8.86	0.13
-78	0.010	-40.00	-28.00	0.00	-33	0.072	-22.91	-10.91	0.08
-77	0.010	-40.00	-28.00	0.00	-32	0.050	-26.01	-14.01	0.04
-76	0.010	-40.00	-28.00	0.00	-31	0.026	-31.62	-19.62	0.01
-75	0.010	-40.00	-28.00	0.00	-30	0.010	-40.00	-28.00	0.00
-74	0.010	-40.00	-28.00	0.00	-29	0.029	-30.86	-18.86	0.01
-73	0.010	-40.00	-28.00	0.00	-28	0.060	-24.51	-12.51	0.06
-72	0.012	-38.42	-26.42	0.00	-27	0.093	-20.66	-8.66	0.14
-71	0.015	-36.68	-24.68	0.00	-26	0.128	-17.86	-5.86	0.26
-70	0.018	-35.06	-23.06	0.00	-25	0.165	-15.63	-3.63	0.43
-69	0.022	-33.31	-21.31	0.01	-24	0.204	-13.79	-1.79	0.66
-68	0.026	-31.69	-19.69	0.01	-23	0.245	-12.22	-0.22	0.95
-67	0.031	-30.20	-18.20	0.02	-22	0.287	-10.84	1.16	1.31
-66	0.036	-28.81	-16.81	0.02	-21	0.330	-9.62	2.38	1.73
-65	0.042	-27.51	-15.51	0.03	-20	0.375	-8.52	3.48	2.23
-64	0.048	-26.41	-14.41	0.04	-19	0.420	-7.54	4.46	2.79
-63	0.054	-25.36	-13.36	0.05	-18	0.465	-6.65	5.35	3.43
-62	0.060	-24.38	-12.38	0.06	-17	0.510	-5.84	6.16	4.13
-61	0.067	-23.45	-11.45	0.07	-16	0.556	-5.10	6.90	4.90
-60	0.074	-22.57	-10.57	0.09	-15	0.601	-4.42	7.58	5.73
-59	0.081	-21.80	-9.80	0.10	-14	0.645	-3.81	8.19	6.59
-58	0.088	-21.07	-9.07	0.12	-13	0.687	-3.25	8.75	7.49
-57	0.096	-20.38	-8.38	0.15	-12	0.729	-2.75	9.25	8.42
-56	0.103	-19.74	-7.74	0.17	-11	0.769	-2.28	9.72	9.37
-55	0.110	-19.14	-7.14	0.19	-10	0.807	-1.86	10.14	10.32
-54	0.118	-18.59	-6.59	0.22	-9	0.840	-1.51	10.49	11.19
-53	0.125	-18.07	-6.07	0.25	-8	0.872	-1.19	10.81	12.04
-52	0.132	-17.60	-5.60	0.28	-7	0.900	-0.92	11.08	12.83
-51	0.139	-17.16	-5.16	0.30	-6	0.925	-0.67	11.33	13.57
-50	0.145	-16.78	-4.78	0.33	-5	0.948	-0.47	11.53	14.23
-49	0.151	-16.44	-4.44	0.36	-4	0.965	-0.31	11.69	14.77
-48	0.156	-16.16	-4.16	0.38	-3	0.979	-0.18	11.82	15.20
-47	0.160	-15.92	-3.92	0.41	-2	0.990	-0.09	11.91	15.53
-46	0.163	-15.73	-3.73	0.42	-1	0.997	-0.03	11.97	15.74
					0	1.000	0.00	12.00	15.85



FIGURE EE1 (3 of 3)

Three bay CL-FM/HRM/50N Array

Frequency: 107.1 MHz

Gain: 12.0 dBd (x 15.8)

Horizontal Polarization

Vertical stacked 0.5 wavelength

Vertical plane Pattern

Angle	Field	Rel.dB	dBd	PwrMult	Angle	Field	Rel.dB	dBd	PwrMult
0	1.000	0.00	12.00	15.85	45	0.166	-15.59	-3.59	0.44
1	0.997	-0.03	11.97	15.74	46	0.163	-15.73	-3.73	0.42
2	0.990	-0.09	11.91	15.53	47	0.160	-15.92	-3.92	0.41
3	0.979	-0.18	11.82	15.20	48	0.156	-16.16	-4.16	0.38
4	0.965	-0.31	11.69	14.77	49	0.151	-16.44	-4.44	0.36
5	0.948	-0.47	11.53	14.23	50	0.145	-16.78	-4.78	0.33
6	0.925	-0.67	11.33	13.57	51	0.139	-17.16	-5.16	0.30
7	0.900	-0.92	11.08	12.83	52	0.132	-17.60	-5.60	0.28
8	0.872	-1.19	10.81	12.04	53	0.125	-18.07	-6.07	0.25
9	0.840	-1.51	10.49	11.19	54	0.118	-18.59	-6.59	0.22
10	0.807	-1.86	10.14	10.32	55	0.110	-19.14	-7.14	0.19
11	0.769	-2.28	9.72	9.37	56	0.103	-19.74	-7.74	0.17
12	0.729	-2.75	9.25	8.42	57	0.096	-20.38	-8.38	0.15
13	0.687	-3.25	8.75	7.49	58	0.088	-21.07	-9.07	0.12
14	0.645	-3.81	8.19	6.59	59	0.081	-21.80	-9.80	0.10
15	0.601	-4.42	7.58	5.73	60	0.074	-22.57	-10.57	0.09
16	0.556	-5.10	6.90	4.90	61	0.067	-23.45	-11.45	0.07
17	0.510	-5.84	6.16	4.13	62	0.060	-24.38	-12.38	0.06
18	0.465	-6.65	5.35	3.43	63	0.054	-25.36	-13.36	0.05
19	0.420	-7.54	4.46	2.79	64	0.048	-26.41	-14.41	0.04
20	0.375	-8.52	3.48	2.23	65	0.042	-27.51	-15.51	0.03
21	0.330	-9.62	2.38	1.73	66	0.036	-28.81	-16.81	0.02
22	0.287	-10.84	1.16	1.31	67	0.031	-30.20	-18.20	0.02
23	0.245	-12.22	-0.22	0.95	68	0.026	-31.69	-19.69	0.01
24	0.204	-13.79	-1.79	0.66	69	0.022	-33.31	-21.31	0.01
25	0.165	-15.63	-3.63	0.43	70	0.018	-35.06	-23.06	0.00
26	0.128	-17.85	-5.85	0.26	71	0.015	-36.68	-24.68	0.00
27	0.093	-20.66	-8.66	0.14	72	0.012	-38.42	-26.42	0.00
28	0.060	-24.50	-12.50	0.06	73	0.010	-40.00	-28.00	0.00
29	0.029	-30.86	-18.86	0.01	74	0.010	-40.00	-28.00	0.00
30	0.010	-40.00	-28.00	0.00	75	0.010	-40.00	-28.00	0.00
31	0.026	-31.62	-19.62	0.01	76	0.010	-40.00	-28.00	0.00
32	0.050	-26.01	-14.01	0.04	77	0.010	-40.00	-28.00	0.00
33	0.072	-22.91	-10.91	0.08	78	0.010	-40.00	-28.00	0.00
34	0.091	-20.86	-8.86	0.13	79	0.010	-40.00	-28.00	0.00
35	0.107	-19.38	-7.38	0.18	80	0.010	-40.00	-28.00	0.00
36	0.122	-18.28	-6.28	0.24	81	0.010	-40.00	-28.00	0.00
37	0.134	-17.44	-5.44	0.29	82	0.010	-40.00	-28.00	0.00
38	0.144	-16.81	-4.81	0.33	83	0.010	-40.00	-28.00	0.00
39	0.153	-16.31	-4.31	0.37	84	0.010	-40.00	-28.00	0.00
40	0.159	-15.96	-3.96	0.40	85	0.010	-40.00	-28.00	0.00
41	0.164	-15.72	-3.72	0.42	86	0.010	-40.00	-28.00	0.00
42	0.166	-15.58	-3.58	0.44	87	0.010	-40.00	-28.00	0.00
43	0.168	-15.52	-3.52	0.44	88	0.010	-40.00	-28.00	0.00
44	0.167	-15.52	-3.52	0.44	89	0.010	-40.00	-28.00	0.00
					90	0.010	-40.00	-28.00	0.00

## FIGURE EE2

### FREE SPACE FIELD STRENGTH AT A DISTANCE STUDY RESULTS

PROJECT: HAUPPAGRE, NY, CHANNEL 296D

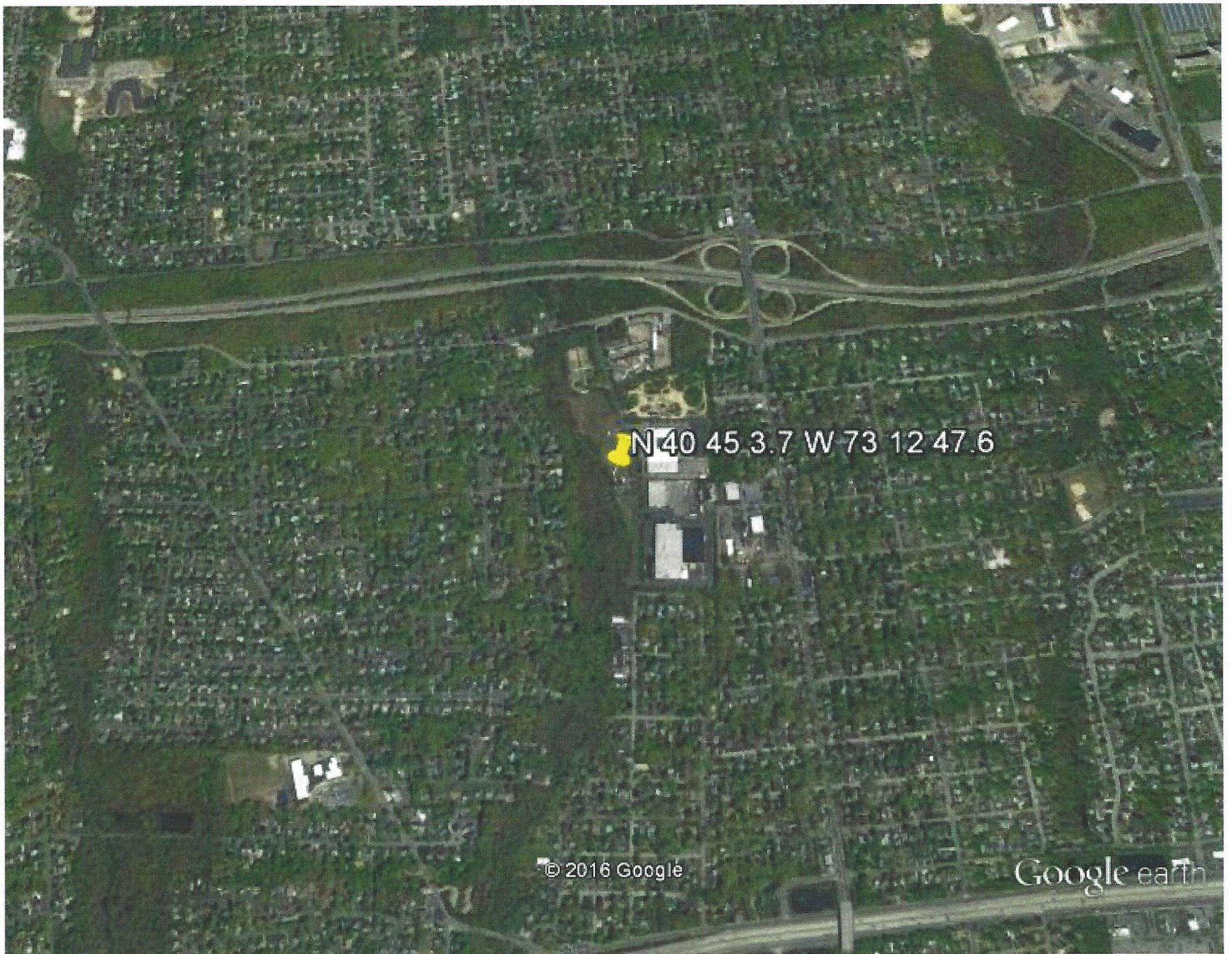
9-Aug-16

	Column A	Column B	Column C	Column D	Column E	Column F	Column G	Column H	Column I	Column J	Column K
	Vert	Horiz	Hypot-	Down-			Pattern	Free	Adjusted	Interf	Vert
	Dist	Dist	enuse	ward			Relative	Space	ERP in	Distance	Interf
	From	From	Dist	Angle			Field at	Inter-	Down-	along	Distance
	Ant	Tower	fr Ant	fr Ant	Max	Max	Down-	ferring	ward	Hypot-	below
	Bottom	Base	Bottom	Bottom	ERP	ERP	ward	Signal	Angle	enuse	Antenna
Pt	(meters)	(meters)	(meters)	(degrees)	(watts)	(dBmw)	Angle	(dBu)	(dBmW)	(meters)	(meters)
1	145	0.1	145.0	<a href="#">90.0</a>	35	<a href="#">45.44</a>	0.010	94.0	<a href="#">5.44</a>	8.3	<a href="#">8.3</a>
2	145	20	146.4	<a href="#">82.1</a>	35	<a href="#">45.44</a>	0.010	94.0	<a href="#">5.44</a>	8.3	<a href="#">8.2</a>
3	145	40	150.4	<a href="#">74.6</a>	35	<a href="#">45.44</a>	0.010	94.0	<a href="#">5.44</a>	8.3	<a href="#">8.0</a>
4	145	60	156.9	<a href="#">67.5</a>	35	<a href="#">45.44</a>	0.031	94.0	<a href="#">15.27</a>	25.8	<a href="#">23.8</a>
5	145	80	165.6	<a href="#">61.1</a>	35	<a href="#">45.44</a>	0.067	94.0	<a href="#">21.96</a>	55.7	<a href="#">48.7</a>
6	145	100	176.1	<a href="#">55.4</a>	35	<a href="#">45.44</a>	0.110	94.0	<a href="#">26.27</a>	91.4	<a href="#">75.2</a>
7	145	200	247.0	<a href="#">35.9</a>	35	<a href="#">45.44</a>	0.122	94.0	<a href="#">27.17</a>	101.4	<a href="#">59.5</a>
8	145	300	333.2	<a href="#">25.8</a>	35	<a href="#">45.44</a>	0.165	94.0	<a href="#">29.79</a>	137.1	<a href="#">59.7</a>
9	145	400	425.5	<a href="#">19.9</a>	35	<a href="#">45.44</a>	0.420	94.0	<a href="#">37.91</a>	349.0	<a href="#">118.9</a>
10	145	500	520.6	<a href="#">16.2</a>	35	<a href="#">45.44</a>	0.556	94.0	<a href="#">40.34</a>	462.0	<a href="#">128.7</a>
11	145	600	617.3	<a href="#">13.6</a>	35	<a href="#">45.44</a>	0.687	94.0	<a href="#">42.18</a>	570.8	<a href="#">134.1</a>
12	145	700	714.9	<a href="#">11.7</a>	35	<a href="#">45.44</a>	0.769	94.0	<a href="#">43.16</a>	638.9	<a href="#">129.6</a>
13	145	800	813.0	<a href="#">10.3</a>	35	<a href="#">45.44</a>	0.807	94.0	<a href="#">43.58</a>	670.5	<a href="#">119.6</a>
14	145	831	843.6	<a href="#">9.9</a>	35	<a href="#">45.44</a>	0.840	94.0	<a href="#">43.93</a>	697.9	<a href="#">120.0</a>

NOTE: Study point at 2 meters above ground (or rooftop, see write-up) level.

**RESULTS: COLUMN J DISTANCES ARE LESS THAN COLUMN C AND COLUMN K DISTANCES ARE LESS THAN COLUMN A DISTANCES IN ALL INSTANCES; THEREFORE, INTERFERRING SIGNAL DOES NOT EXIST AT ANY LOCATION (TWO METERS OR LESS ABOVE GROUND LEVEL)**





Google earth

