

**DELAWDER COMMUNICATIONS, INC.**

P.O. Box 1095  
Ashburn, Virginia 20146-1095  
(703) 299-9222

**ENGINEERING REPORT**

---

**Parsippany, NJ, Channel 232D FM Translator Application**

**ENGINEERING STATEMENT—NEW FM TRANSLATOR FOR WXMC(AM)**

All contour non-overlap protection requirements are met with the exception of WNYC-FM, New York, NY, 230B and WNYC-FM, Newark, NJ, 234B, discussed below.

**PROTECTION TO WNYC-FM AND WFMT(FM)**

WNYC-FM (33.5 kilometers at 113 degrees True) and WFMT (11.8 kilometers at 136 degrees True) are second adjacent-channel to the proposed channel 232D facility. The 54 dBu F50,50 service contours of WNYC-FM and WFMT extend well beyond the proposed 232D transmitter site. Using the well-established *Living Way Ministries* Methodology, no actual interference to any population is predicted to exist to WNYC-FM or WFMT.

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 WNYC-FM at the proposed 232D transmitter site is greater than 69 dBu (the “desired” signal to WNYC-FM). The F50,50 signal strength from WFMT at the proposed 232D transmitter site is greater than 85 dBu (the “desired” signal to WFMT). 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 the worst case protection requirement to WNYC-FM from the proposed 232D facility is a signal of greater than or equal to 109 dBu.

Figure EE1 is the vertical plane relative field pattern for the proposed Scala CL-FM(V) three-bay antenna (full wavelength separation). By adjusting for the vertical plane downward relative field values of the proposed antenna, it is herein demonstrated that the 109 dBu interfering signal (using a free space field determination) does not exist at any point at ground level within the study distance of 420 meters from the transmitter site. (Actually, the study is made to 2 meters above ground level to account for a person’s height.) The free space loss signal of 109 dBu using the maximum 250

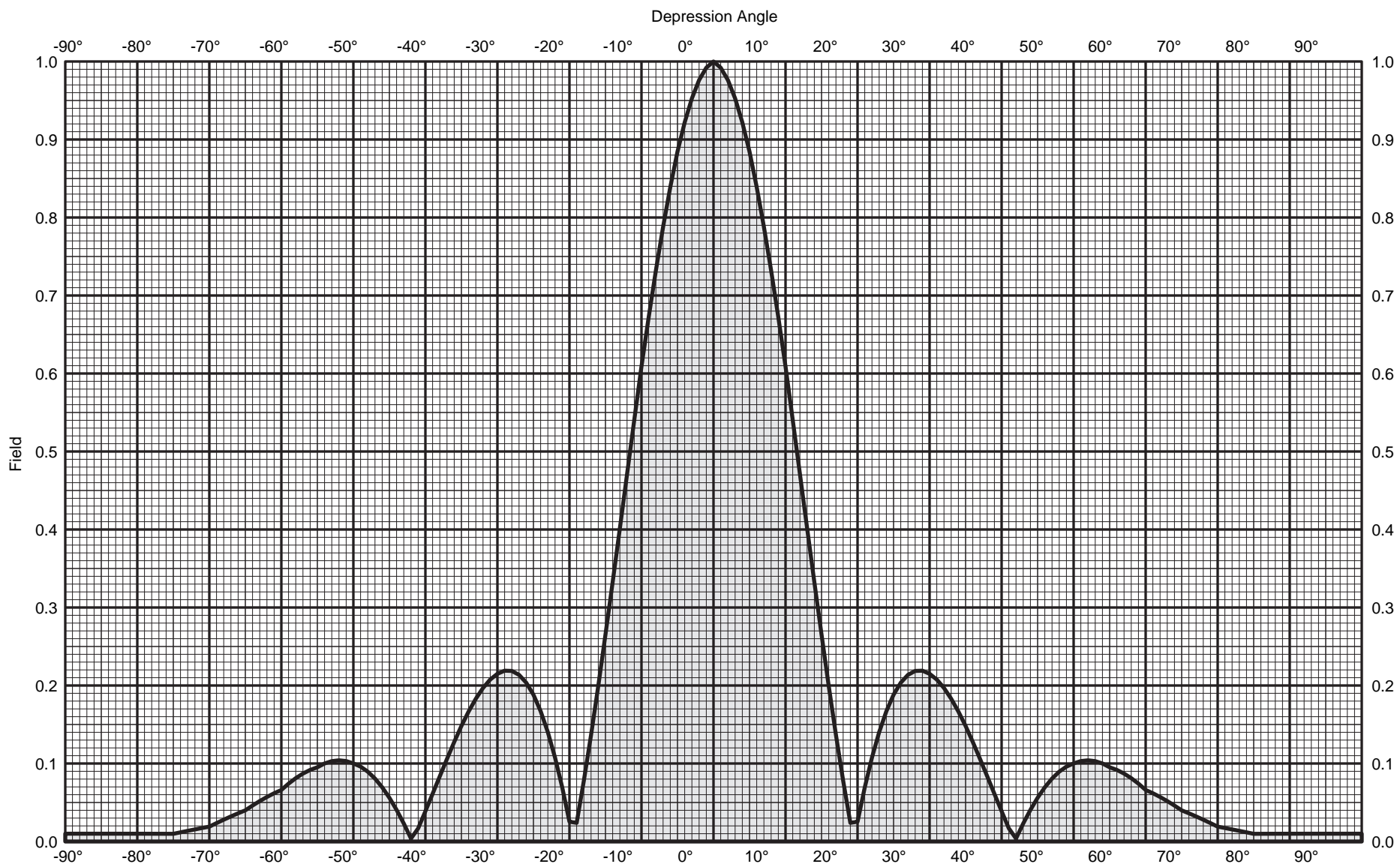
watt ERP on the main lobe (at 280 degrees True) extends to 395 meters so the 420 meter study distance is appropriate.

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 more than 4 meters in all cases. (It is noted that the ground elevation is not more than 3 meters above the ground elevation at the tower site within 395 meters of the tower.) There are no tall buildings within 395 meters of the proposed site.

See attached aerial photo. The home in the main antenna lobe to the west are more than 395 meters away and are, therefore, adequately protected. The 109 dBu free space loss signal from Due North clockwise to Due South is in the deep null of the Scala CI-FM(V) antenna and extends only 26 meters from the antenna. (The ERP in the null is less than one watt.) Therefore, from 0 degrees True clockwise to 180, the 109 dBu signal of the proposed FM facility does not reach any structures or roads.

Based on the above, pursuant to Section 74.1204(d) of the FCC Rules, WNYC-FM and WFMT are adequately protected by the proposed facility.

FIGURE EE1 (1 of 3)



3 x CL-FM/VRM/50N Log-periodic Array

Frequency: 98.3 MHz

Gain: 10.9 dBd (x 12.3)

Vertical polarization

Vertical stacked 1.0 Wavelength

Vertical plane Pattern

FIGURE EE1 (2 of 3)



3 x CL-FM/VRM/50N Log-periodic Array

Frequency: 98.3 MHz

Gain: 10.9 dBd (x 12.3)

Vertical polarization

Vertical stacked 1.0 Wavelength

Vertical plane Pattern

Angle	Field	Rel.dB	dBd	PwrMult	Angle	Field	Rel.dB	dBd	PwrMult
-90	0.010	-40.00	-29.10	0.00	-45	0.056	-25.03	-14.13	0.04
-89	0.010	-40.00	-29.10	0.00	-44	0.041	-27.85	-16.95	0.02
-88	0.010	-40.00	-29.10	0.00	-43	0.023	-32.75	-21.85	0.01
-87	0.010	-40.00	-29.10	0.00	-42	0.010	-40.00	-29.10	0.00
-86	0.010	-40.00	-29.10	0.00	-41	0.017	-35.43	-24.53	0.00
-85	0.010	-40.00	-29.10	0.00	-40	0.039	-28.22	-17.32	0.02
-84	0.010	-40.00	-29.10	0.00	-39	0.061	-24.27	-13.37	0.05
-83	0.010	-40.00	-29.10	0.00	-38	0.084	-21.55	-10.65	0.09
-82	0.010	-40.00	-29.10	0.00	-37	0.106	-19.50	-8.60	0.14
-81	0.010	-40.00	-29.10	0.00	-36	0.128	-17.89	-6.99	0.20
-80	0.010	-40.00	-29.10	0.00	-35	0.148	-16.59	-5.69	0.27
-79	0.010	-40.00	-29.10	0.00	-34	0.167	-15.57	-4.67	0.34
-78	0.010	-40.00	-29.10	0.00	-33	0.183	-14.75	-3.85	0.41
-77	0.010	-40.00	-29.10	0.00	-32	0.197	-14.12	-3.22	0.48
-76	0.010	-40.00	-29.10	0.00	-31	0.208	-13.65	-2.75	0.53
-75	0.010	-40.00	-29.10	0.00	-30	0.215	-13.35	-2.45	0.57
-74	0.012	-38.59	-27.69	0.00	-29	0.219	-13.19	-2.29	0.59
-73	0.014	-37.30	-26.40	0.00	-28	0.219	-13.20	-2.30	0.59
-72	0.015	-36.19	-25.29	0.00	-27	0.214	-13.41	-2.51	0.56
-71	0.017	-35.24	-24.34	0.00	-26	0.204	-13.82	-2.92	0.51
-70	0.019	-34.40	-23.50	0.00	-25	0.188	-14.51	-3.61	0.44
-69	0.024	-32.55	-21.65	0.01	-24	0.167	-15.55	-4.65	0.34
-68	0.028	-31.08	-20.18	0.01	-23	0.140	-17.07	-6.17	0.24
-67	0.032	-29.86	-18.96	0.01	-22	0.108	-19.36	-8.46	0.14
-66	0.036	-28.84	-17.94	0.02	-21	0.069	-23.19	-12.29	0.06
-65	0.040	-27.97	-17.07	0.02	-20	0.025	-31.90	-21.00	0.01
-64	0.046	-26.73	-15.83	0.03	-19	0.024	-32.45	-21.55	0.01
-63	0.052	-25.71	-14.81	0.03	-18	0.078	-22.16	-11.26	0.07
-62	0.057	-24.87	-13.97	0.04	-17	0.137	-17.29	-6.39	0.23
-61	0.062	-24.17	-13.27	0.05	-16	0.199	-14.01	-3.11	0.49
-60	0.066	-23.60	-12.70	0.05	-15	0.265	-11.53	-0.63	0.87
-59	0.074	-22.60	-11.70	0.07	-14	0.333	-9.56	1.34	1.36
-58	0.081	-21.81	-10.91	0.08	-13	0.401	-7.93	2.97	1.98
-57	0.087	-21.20	-10.30	0.09	-12	0.471	-6.54	4.36	2.73
-56	0.092	-20.75	-9.85	0.10	-11	0.540	-5.34	5.56	3.59
-55	0.095	-20.43	-9.53	0.11	-10	0.609	-4.31	6.59	4.56
-54	0.100	-20.00	-9.10	0.12	-9	0.672	-3.45	7.45	5.56
-53	0.103	-19.74	-8.84	0.13	-8	0.732	-2.71	8.19	6.59
-52	0.104	-19.65	-8.75	0.13	-7	0.788	-2.07	8.83	7.64
-51	0.103	-19.73	-8.83	0.13	-6	0.839	-1.53	9.37	8.66
-50	0.100	-19.99	-9.09	0.12	-5	0.884	-1.07	9.83	9.62
-49	0.096	-20.35	-9.45	0.11	-4	0.922	-0.71	10.19	10.46
-48	0.090	-20.96	-10.06	0.10	-3	0.953	-0.42	10.48	11.17
-47	0.081	-21.86	-10.96	0.08	-2	0.976	-0.21	10.69	11.72
-46	0.069	-23.16	-12.26	0.06	-1	0.992	-0.07	10.83	12.11
					0	1.000	0.00	10.90	12.30

FIGURE EE1 (3 of 3)



3 x CL-FM/VRM/50N Log-periodic Array

Frequency: 98.3 MHz

Gain: 10.9 dBd (x 12.3)

Vertical polarization

Vertical stacked 1.0 Wavelength

Vertical plane Pattern

Angle	Field	Rel.dB	dBd	PwrMult	Angle	Field	Rel.dB	dBd	PwrMult
0	1.000	0.00	10.90	12.30	45	0.056	-25.03	-14.13	0.04
1	0.992	-0.07	10.83	12.11	46	0.069	-23.16	-12.26	0.06
2	0.976	-0.21	10.69	11.72	47	0.081	-21.86	-10.96	0.08
3	0.953	-0.42	10.48	11.17	48	0.090	-20.96	-10.06	0.10
4	0.922	-0.71	10.19	10.46	49	0.096	-20.35	-9.45	0.11
5	0.884	-1.07	9.83	9.62	50	0.100	-19.99	-9.09	0.12
6	0.839	-1.53	9.37	8.66	51	0.103	-19.73	-8.83	0.13
7	0.788	-2.07	8.83	7.64	52	0.104	-19.65	-8.75	0.13
8	0.732	-2.71	8.19	6.59	53	0.103	-19.74	-8.84	0.13
9	0.672	-3.45	7.45	5.56	54	0.100	-20.00	-9.10	0.12
10	0.609	-4.31	6.59	4.56	55	0.095	-20.43	-9.53	0.11
11	0.541	-5.34	5.56	3.59	56	0.092	-20.75	-9.85	0.10
12	0.471	-6.54	4.36	2.73	57	0.087	-21.20	-10.30	0.09
13	0.402	-7.93	2.97	1.98	58	0.081	-21.81	-10.91	0.08
14	0.333	-9.56	1.34	1.36	59	0.074	-22.60	-11.70	0.07
15	0.265	-11.52	-0.62	0.87	60	0.066	-23.60	-12.70	0.05
16	0.199	-14.01	-3.11	0.49	61	0.062	-24.17	-13.27	0.05
17	0.137	-17.29	-6.39	0.23	62	0.057	-24.87	-13.97	0.04
18	0.078	-22.16	-11.26	0.07	63	0.052	-25.71	-14.81	0.03
19	0.024	-32.44	-21.54	0.01	64	0.046	-26.73	-15.83	0.03
20	0.025	-31.91	-21.01	0.01	65	0.040	-27.97	-17.07	0.02
21	0.069	-23.19	-12.29	0.06	66	0.036	-28.84	-17.94	0.02
22	0.108	-19.37	-8.47	0.14	67	0.032	-29.86	-18.96	0.01
23	0.140	-17.07	-6.17	0.24	68	0.028	-31.08	-20.18	0.01
24	0.167	-15.55	-4.65	0.34	69	0.024	-32.55	-21.65	0.01
25	0.188	-14.51	-3.61	0.44	70	0.019	-34.40	-23.50	0.00
26	0.204	-13.82	-2.92	0.51	71	0.017	-35.24	-24.34	0.00
27	0.214	-13.41	-2.51	0.56	72	0.015	-36.19	-25.29	0.00
28	0.219	-13.20	-2.30	0.59	73	0.014	-37.30	-26.40	0.00
29	0.219	-13.19	-2.29	0.59	74	0.012	-38.59	-27.69	0.00
30	0.215	-13.35	-2.45	0.57	75	0.010	-40.00	-29.10	0.00
31	0.208	-13.65	-2.75	0.53	76	0.010	-40.00	-29.10	0.00
32	0.197	-14.12	-3.22	0.48	77	0.010	-40.00	-29.10	0.00
33	0.183	-14.75	-3.85	0.41	78	0.010	-40.00	-29.10	0.00
34	0.167	-15.57	-4.67	0.34	79	0.010	-40.00	-29.10	0.00
35	0.148	-16.59	-5.69	0.27	80	0.010	-40.00	-29.10	0.00
36	0.128	-17.88	-6.98	0.20	81	0.010	-40.00	-29.10	0.00
37	0.106	-19.50	-8.60	0.14	82	0.010	-40.00	-29.10	0.00
38	0.084	-21.55	-10.65	0.09	83	0.010	-40.00	-29.10	0.00
39	0.061	-24.27	-13.37	0.05	84	0.010	-40.00	-29.10	0.00
40	0.039	-28.22	-17.32	0.02	85	0.010	-40.00	-29.10	0.00
41	0.017	-35.43	-24.53	0.00	86	0.010	-40.00	-29.10	0.00
42	0.010	-40.00	-29.10	0.00	87	0.010	-40.00	-29.10	0.00
43	0.023	-32.76	-21.86	0.01	88	0.010	-40.00	-29.10	0.00
44	0.041	-27.85	-16.95	0.02	89	0.010	-40.00	-29.10	0.00
					90	0.010	-40.00	-29.10	0.00

## FIGURE EE2

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

PROJECT: PARSIPPANY, NJ CHANNEL 232D

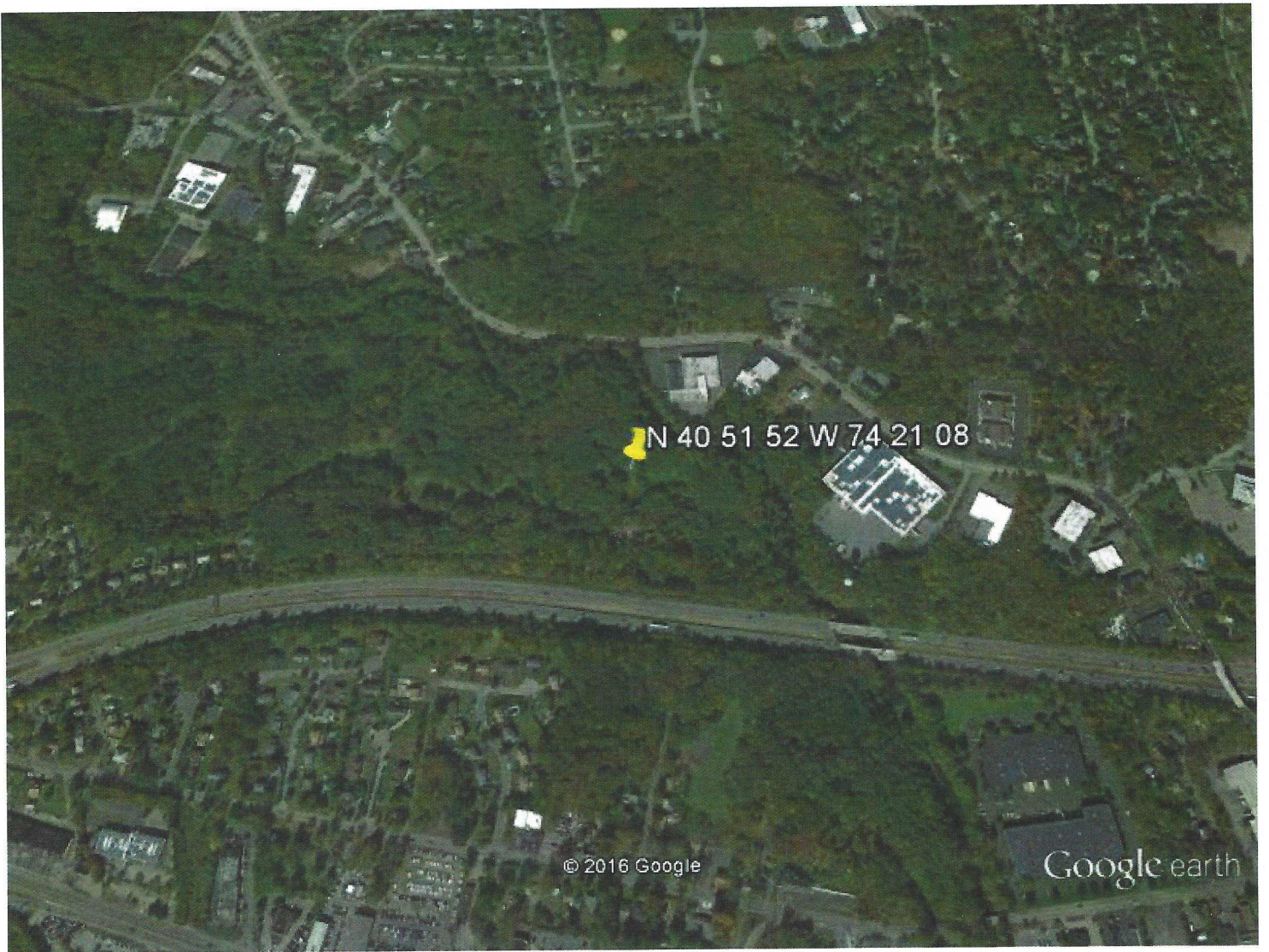
20-Jan-16

	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	50	0.1	50.0	<a href="#">89.9</a>	250	<a href="#">53.98</a>	0.010	109.0	<a href="#">13.98</a>	3.9	<a href="#">3.9</a>
2	50	20	53.9	<a href="#">68.2</a>	250	<a href="#">53.98</a>	0.028	109.0	<a href="#">22.92</a>	11.1	<a href="#">10.3</a>
3	50	40	64.0	<a href="#">51.3</a>	250	<a href="#">53.98</a>	0.104	109.0	<a href="#">34.32</a>	41.1	<a href="#">32.1</a>
4	50	60	78.1	<a href="#">39.8</a>	250	<a href="#">53.98</a>	0.061	109.0	<a href="#">29.69</a>	24.1	<a href="#">15.4</a>
5	50	80	94.3	<a href="#">32.0</a>	250	<a href="#">53.98</a>	0.197	109.0	<a href="#">39.87</a>	77.8	<a href="#">41.2</a>
6	50	100	111.8	<a href="#">26.6</a>	250	<a href="#">53.98</a>	0.214	109.0	<a href="#">40.59</a>	84.5	<a href="#">37.8</a>
7	50	130	139.3	<a href="#">21.0</a>	250	<a href="#">53.98</a>	0.069	109.0	<a href="#">30.76</a>	27.2	<a href="#">9.8</a>
8	50	160	167.6	<a href="#">17.4</a>	250	<a href="#">53.98</a>	0.137	109.0	<a href="#">36.71</a>	54.1	<a href="#">16.1</a>
9	50	190	196.5	<a href="#">14.7</a>	250	<a href="#">53.98</a>	0.333	109.0	<a href="#">44.43</a>	131.5	<a href="#">33.5</a>
10	50	220	225.6	<a href="#">12.8</a>	250	<a href="#">53.98</a>	0.471	109.0	<a href="#">47.44</a>	186.0	<a href="#">41.2</a>
11	50	260	264.8	<a href="#">10.9</a>	250	<a href="#">53.98</a>	0.609	109.0	<a href="#">49.67</a>	240.5	<a href="#">45.4</a>
12	50	300	304.1	<a href="#">9.5</a>	250	<a href="#">53.98</a>	0.672	109.0	<a href="#">50.53</a>	265.4	<a href="#">43.6</a>
13	50	340	343.7	<a href="#">8.4</a>	250	<a href="#">53.98</a>	0.732	109.0	<a href="#">51.27</a>	289.1	<a href="#">42.1</a>
14	50	380	383.3	<a href="#">7.5</a>	250	<a href="#">53.98</a>	0.788	109.0	<a href="#">51.91</a>	311.2	<a href="#">40.6</a>
15	50	420	423.0	<a href="#">6.8</a>	250	<a href="#">53.98</a>	0.839	109.0	<a href="#">52.45</a>	331.3	<a href="#">39.2</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

