

**DELAUDER COMMUNICATIONS, INC.**

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**ENGINEERING REPORT**

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**Cherry Hill, NJ, Channel 279D FM Translator Application**

**ENGINEERING STATEMENT**

Priority Radio, Inc. ("Applicant") submits this Long-form Application that covers its pending Auction 83 Short-form Application for a new FM translator station at Cherry Hill, NJ. The pending application file number is BNPFT-20030312AFX.

**There are no tech box changes being made by this long-form application.**

**CHANNEL STUDY**

Attached as Figure EE1 is a channel study for the proposed channel 279D facility. All required protections are met by contour non-overlap pursuant to Section 74.1204, with the exception of protection to WPRB, Princeton, NJ, 277B. WPRB is protected, as discussed below.

**CONTOUR OVERLAP SHOWING**

The service and interference contour distances that are listed on Figure EE1 use the worst-case (greatest) distance along any bearing for each facility, and also considers each protected station as omni-directional. No contour overlap using this worst-case test means no possible contour overlap when applying Section 73.313 methodology.

Figures EE2, EE3 and EE3 (Magnified), attached, show non-overlap between the service contours of WPPZ-FM and WMGM and the interference contours of the proposed channel 279D facility. All contours were determined pursuant to Section 73.313 of the FCC Rules using a USGS 3 arc-second terrain database at one-degree radial intervals.

**PROTECTION TO WPRB**

WPRB, Princeton, NJ, 277B, is second adjacent-channel to the proposed

channel 279D facility and is located only 52.0 kilometers (at 25 degrees True bearing) from the 279D transmitter site. The 54 dBu F50,50 service contour extends beyond the proposed 279D transmitter site. Using the well-established *Living Way Ministries* Methodology, no actual interference to any population is predicted to exist to WPRB.

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 this station.

The F50,50 signal strength from WPRB at the proposed 279D transmitter site is 58.5 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 WPRB from the proposed 279D facility is a signal of greater than or equal to 98.5 dBu.

Figure EE4 is the vertical plane relative field pattern for the proposed antenna. By adjusting for the vertical plane downward relative field values of the proposed antenna, it is herein demonstrated that the 98.5 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 EE5 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). Because the calculated distance to the free space interfering signal (Column J) is less than the hypotenuse distance (Column C) 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 above ground level to any point.) Therefore, pursuant to Section 74.1204(d) of the FCC Rules, WPRB is adequately protected by the proposed facility.

The above study results of Figure EE5 assume uniform terrain elevation near the proposed tower. Because the clearance shown (Column C minus Column J values) is at least 15 meters for all rows, this assumption is acceptable for showing non-interference—no actual elevation within 260 meters of the proposed translator tower is at an elevation that is more than 5 meters above that of the tower base elevation.

## **AERIAL PHOTO**

Figure EE6, attached, is an aerial photo of the proposed transmitter site. There are no homes or other residences located within 100 meters of the proposed site. Also, all nearby buildings and homes located with 100 meters and 260 meters of the proposed site are less than 30 meters in height and, therefore, are cleared from interference to WPRB by at least 25 meters. This further supports non-interference to WPRB from the proposed 277D facility.

**SECTION 74.1204 CHANNEL STUDY****PROJECT: CHERRY HILL, NJ, 279D FROM PROPOSED SITE****STUDY COORDINATES: N 39-51-33.0; W 74-56-51.0 (N D-M-S; W D-M-S)**

Call Docket	Channel FacilityID	Class Service	Frequency ERP	Status DA?	City HAAT	State RCAMSL	Country RCAGL	File Number
Latitude	Longitude		ASRN		Dist (km)		Dist (mi)	Azimuth
Licensee/Permittee								

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WPRB 277 B FM 103.3 MHz LIC PRINCETON NJ US BLH-20070221AAV  
 - 53567 14. kW 222. m 257. m 238.4 m  
 N 40 16 58.00 W 74 41 11.00 1045124 52.04 km 32.34 mi 25.17°  
 PRINCETON BROADCASTING SERVICE, INC.

**NOTE: A SHOWING BASED ON THE LIVING WAY MINISTRIES METHODOLOGY TO THIS STATION IS INCLUDED WITH THIS APPLICATION THAT DEMONSTRATES PROTECTION TO THIS FACILITY.**

W278AK 278 D FX 103.5 MHz LIC VILLAGE GREEN PA US BLFT-19980402TE  
 - 85656 0.08 kW DA 79. m 122. m 91. m  
 N 39 50 7.00 W 75 25 25.00 1031114 40.83 km 25.37 mi 266.41°  
 PRIORITY RADIO, INC.

**Protected Contour Dist: 10.7 km Prop 279D Interf Contour Dist: 7.1 km  
 Result: 23.0 km CLEAR (WORST-CASE STUDY)**

WXCX 279 B FM 103.7 MHz LIC HAVRE DE GRACE MD US BLH-20021015ABT  
 - 53488 37. kW DA 168. m 217. m 149. m  
 N 39 33 52.00 W 76 6 7.00 1035692 104.27 km 64.79 mi 252.01°  
 DELMARVA BROADCASTING COMPANY

**Protected Contour Dist: 69.1 km Prop 279D Interf Contour Dist: 23.7 km  
 Result: 11.5 km CLEAR (WORST-CASE STUDY)**

WMGM 279 B FM 103.7 MHz LIC ATLANTIC CITY NJ US BLH-19971121KA  
 - 61100 50. kW DA 106. m 112. m 111. m  
 N 39 23 24.00 W 74 30 45.00 1041208 64.10 km 39.83 mi 144.33°  
 LONGPORT MEDIA, LLC

**Protected Contour Dist: 59.3 km Prop 279D Interf Contour Dist: 23.7 km  
 Result: -18.9 km SHORT (WORST-CASE STUDY); See Contour Non-overlap Showing**

NEW 279 D FX 103.7 MHz APP CHERRY HILL NJ US BNPFT-20030312AFX  
 - 141368 0.009 kW DA 0. m 98. m 52. m  
 N 39 51 33.00 W 74 56 51.00 1038530 0.00 km 0.00 mi 0.00°  
 PRIORITY RADIO, INC.

**NOTE: THIS IS THE AUCTION 83 SHORT-FORM APPLICATION THAT IS BEING COVERED BY THIS LONG-FORM APPLICATION**

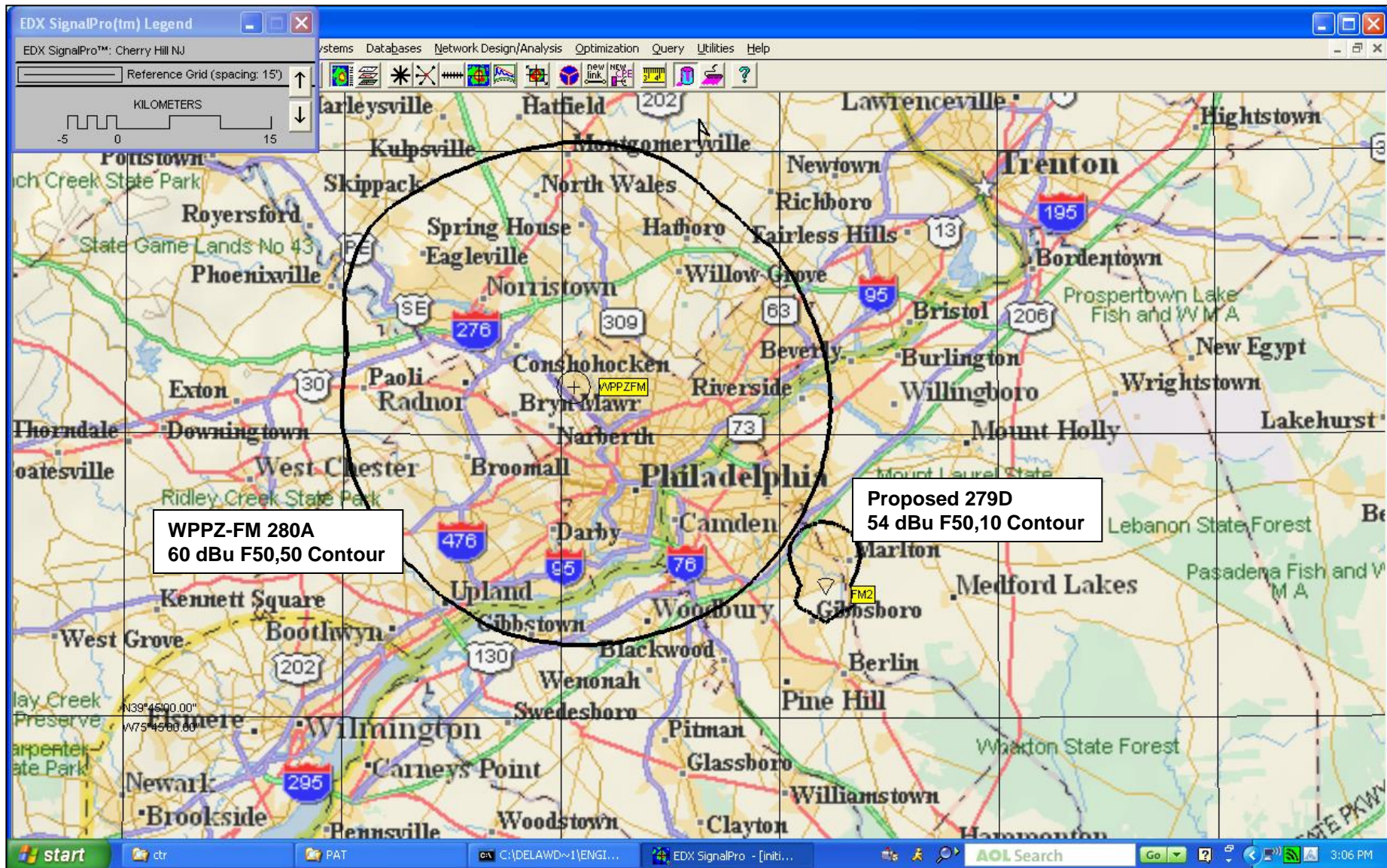
WPPZ-FM 280 A FM 103.9 MHz LIC JENKINTOWN PA US BLH-20070111AAX  
 - 30572 0.27 kW 338. m 403. m 314. m  
 N 40 2 29.60 W 75 14 11.40 1231524 31.94 km 19.85 mi 309.56°  
 RADIO ONE LICENSES, LLC

**Protected Contour Dist: 25.8 km Prop 279D Interf Contour Dist: 7.1 km  
 Result: -1.0 km SHORT (WORST-CASE STUDY); See Contour Non-overlap Showing**

Study Complete

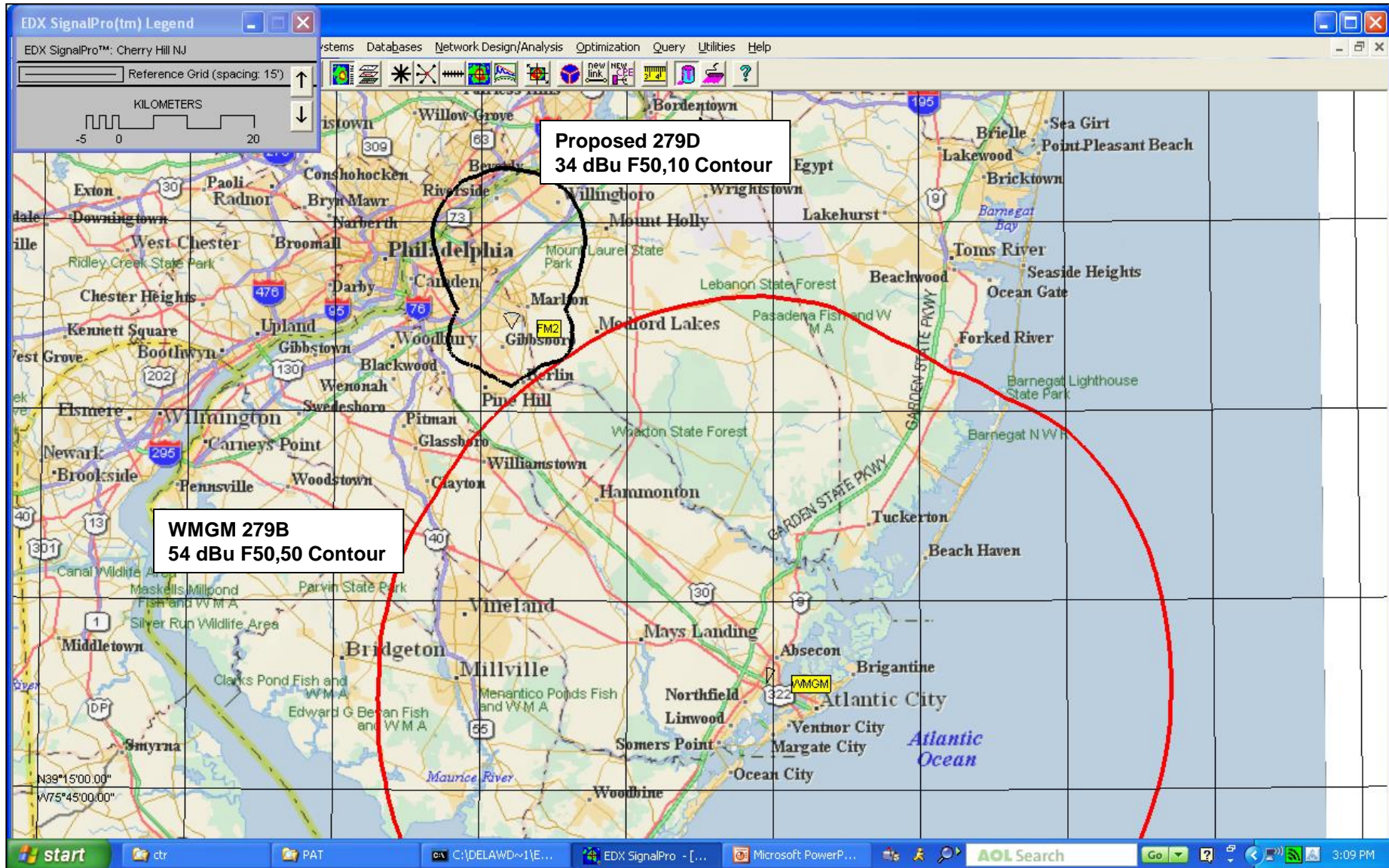
## FIGURE EE2

### Cherry Hill, NJ 279D Contour Non-Overlap Showing to WPPZ-FM





**FIGURE EE3**  
**Cherry Hill, NJ 279D Contour Non-Overlap Showing to WMGM**





**FIGURE EE3 (Magnified)**  
**Cherry Hill, NJ 279D Contour Non-Overlap Showing to WMGM**

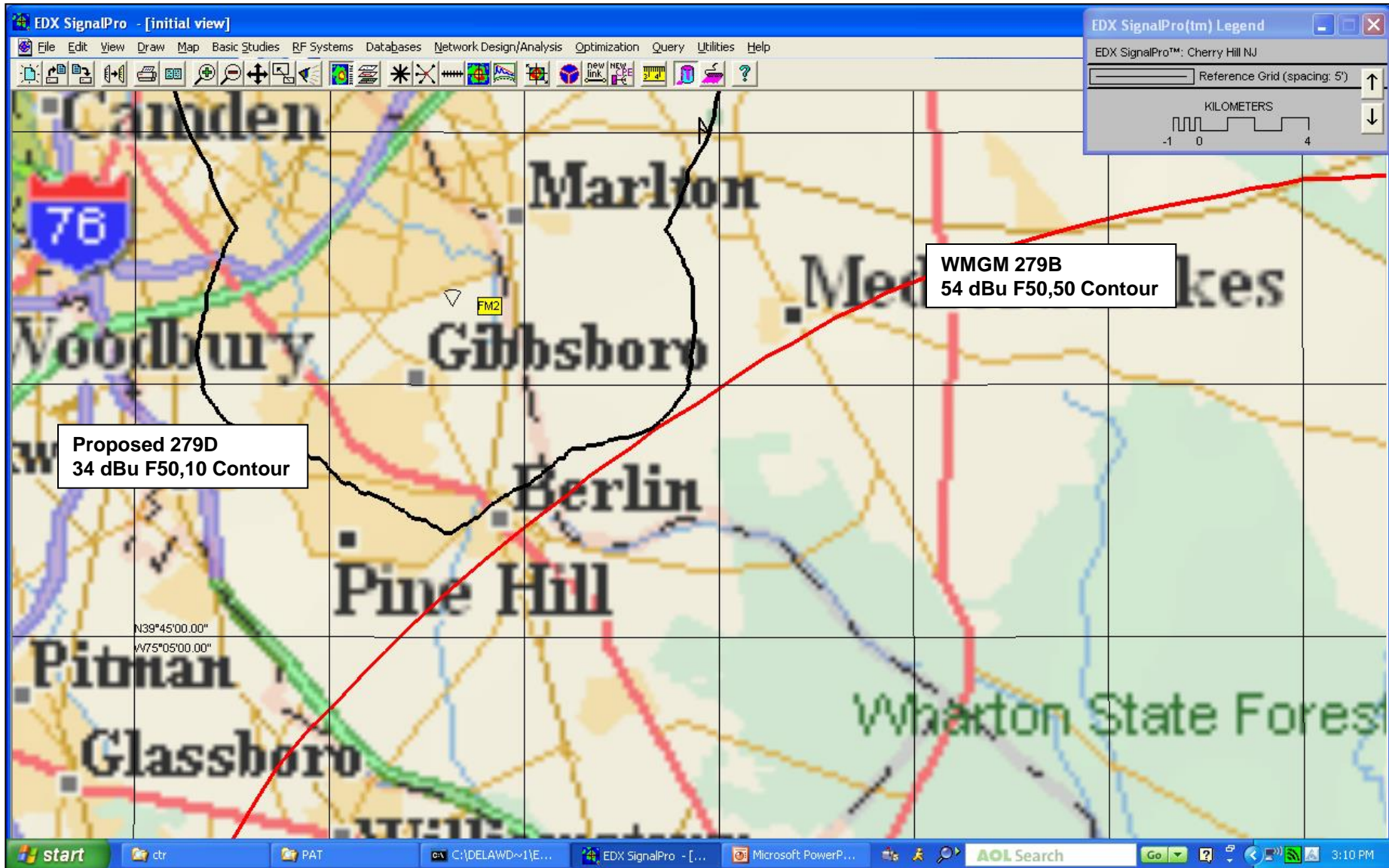
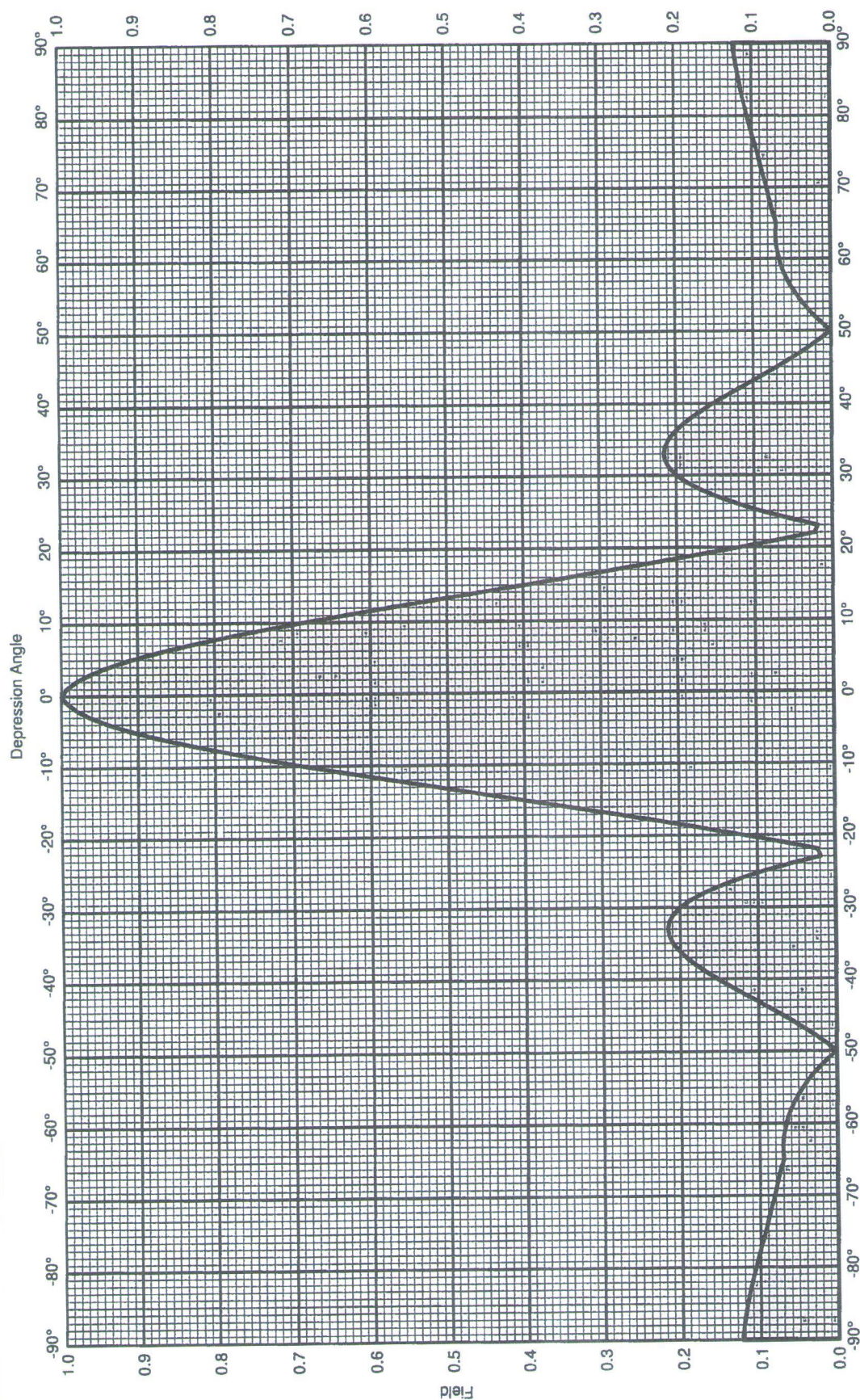




FIGURE EE4 (Page 1 of 2)



Vertical plane Pattern

Three CA5-FM/CP/RM/50N CP Yagis

Vertical stacked 0.87 wavelength

Gain: 9.9 dBd (x 9.8)

Circular Polarization



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FIGURE EE4 (Page 2 of 2)



Three CA5-FM/CP/RM/50N CP Yagis

Vertical plane Pattern

Vertical stacked 0.87 wavelength

Gain: 9.9 dBd (x 9.8)

Circular Polarization

Angle	Field	Rel.dB	dBd	PwrMult	Angle	Field	Rel.dB	dBd	PwrMult
0	1.000	0.00	9.90	9.77	45	0.070	-23.05	-13.15	0.05
1	0.993	-0.06	9.84	9.64	46	0.055	-25.21	-15.31	0.03
2	0.981	-0.17	9.73	9.40	47	0.040	-27.97	-18.07	0.02
3	0.963	-0.33	9.57	9.05	48	0.026	-31.78	-21.88	0.01
4	0.939	-0.55	9.35	8.61	49	0.013	-38.06	-28.16	0.00
5	0.909	-0.82	9.08	8.08	50	0.010	-40.00	-30.10	0.00
6	0.873	-1.18	8.72	7.45	51	0.011	-39.27	-29.37	0.00
7	0.832	-1.60	8.30	6.77	52	0.021	-33.58	-23.68	0.00
8	0.787	-2.08	7.82	6.05	53	0.030	-30.50	-20.60	0.01
9	0.739	-2.63	7.27	5.33	54	0.038	-28.51	-18.61	0.01
10	0.687	-3.26	6.64	4.61	55	0.044	-27.14	-17.24	0.02
11	0.632	-3.98	5.92	3.91	56	0.050	-25.98	-16.08	0.02
12	0.575	-4.80	5.10	3.23	57	0.056	-25.10	-15.20	0.03
13	0.517	-5.73	4.17	2.62	58	0.060	-24.44	-14.54	0.04
14	0.459	-6.77	3.13	2.05	59	0.063	-23.95	-14.05	0.04
15	0.400	-7.97	1.93	1.56	60	0.066	-23.60	-13.70	0.04
16	0.340	-9.36	0.54	1.13	61	0.068	-23.31	-13.41	0.05
17	0.282	-10.99	-1.09	0.78	62	0.070	-23.12	-13.22	0.05
18	0.225	-12.94	-3.04	0.50	63	0.071	-23.03	-13.13	0.05
19	0.171	-15.35	-5.45	0.29	64	0.071	-23.03	-13.13	0.05
20	0.119	-18.51	-8.61	0.14	65	0.070	-23.12	-13.22	0.05
21	0.069	-23.22	-13.32	0.05	66	0.073	-22.78	-12.88	0.05
22	0.023	-32.80	-22.90	0.01	67	0.075	-22.48	-12.58	0.06
23	0.019	-34.22	-24.32	0.00	68	0.078	-22.21	-12.31	0.06
24	0.058	-24.75	-14.85	0.03	69	0.080	-21.98	-12.08	0.06
25	0.092	-20.70	-10.80	0.08	70	0.081	-21.78	-11.88	0.06
26	0.122	-18.26	-8.36	0.15	71	0.084	-21.50	-11.60	0.07
27	0.148	-16.60	-6.70	0.21	72	0.087	-21.24	-11.34	0.07
28	0.169	-15.42	-5.52	0.28	73	0.089	-21.01	-11.11	0.08
29	0.187	-14.58	-4.68	0.34	74	0.091	-20.79	-10.89	0.08
30	0.200	-13.98	-4.08	0.39	75	0.093	-20.59	-10.69	0.09
31	0.209	-13.60	-3.70	0.43	76	0.096	-20.34	-10.44	0.09
32	0.214	-13.40	-3.50	0.45	77	0.099	-20.11	-10.21	0.10
33	0.215	-13.33	-3.43	0.45	78	0.101	-19.89	-9.99	0.10
34	0.214	-13.40	-3.50	0.45	79	0.104	-19.69	-9.79	0.10
35	0.209	-13.58	-3.68	0.43	80	0.106	-19.50	-9.60	0.11
36	0.202	-13.90	-4.00	0.40	81	0.108	-19.30	-9.40	0.11
37	0.192	-14.34	-4.44	0.36	82	0.111	-19.12	-9.22	0.12
38	0.180	-14.89	-4.99	0.32	83	0.113	-18.95	-9.05	0.12
39	0.167	-15.57	-5.67	0.27	84	0.115	-18.79	-8.89	0.13
40	0.152	-16.36	-6.46	0.23	85	0.117	-18.64	-8.74	0.13
41	0.136	-17.31	-7.41	0.18	86	0.119	-18.52	-8.62	0.14
42	0.120	-18.42	-8.52	0.14	87	0.120	-18.40	-8.50	0.14
43	0.103	-19.72	-9.82	0.10	88	0.122	-18.30	-8.40	0.14
44	0.087	-21.24	-11.34	0.07	89	0.123	-18.20	-8.30	0.15
					90	0.124	-18.12	-8.22	0.15

# FIGURE EE5 - STUDY PROTECTING WPRB **277B**

## FREE SPACE FIELD STRENGTH AT A DISTANCE STUDY RESULTS

PROJECT: CHERRY HILL, NJ CHANNEL 279D

27-Aug-13

Point	Column A Vertical Distance From Antenna Bottom (meters)	Column B Horizontal Distance From Tower Base (meters)	Column C Hypotenuse Distance From Antenna Bottom (meters)	Column D Downward Angle From Antenna Bottom (degrees)	Column E Max ERP (watts)	Column F Max ERP (dBmW)	Column G Pattern Relative Field at Down- ward Angle	Column H Free Space Inter- ferring Signal (dBu)	Column I Adjusted ERP in Down- ward Angle (dBmW)	Column J <b>OUTPUT Distance (meters)</b>
1	46	0.1	<b>46.0</b>	<a href="#">89.9</a>	9	<a href="#">39.54</a>	0.124	98.5	<a href="#">21.41</a>	<b>31.1</b>
2	46	10	<b>47.1</b>	<a href="#">77.7</a>	9	<a href="#">39.54</a>	0.101	98.5	<a href="#">19.63</a>	<b>25.3</b>
3	46	20	<b>50.2</b>	<a href="#">66.5</a>	9	<a href="#">39.54</a>	0.075	98.5	<a href="#">17.04</a>	<b>18.8</b>
4	46	30	<b>54.9</b>	<a href="#">56.9</a>	9	<a href="#">39.54</a>	0.056	98.5	<a href="#">14.51</a>	<b>14.1</b>
5	46	40	<b>61.0</b>	<a href="#">49.0</a>	9	<a href="#">39.54</a>	0.012	98.5	<a href="#">1.13</a>	<b>3.0</b>
6	46	50	<b>67.9</b>	<a href="#">42.6</a>	9	<a href="#">39.54</a>	0.120	98.5	<a href="#">21.13</a>	<b>30.1</b>
7	46	70	<b>83.8</b>	<a href="#">33.3</a>	9	<a href="#">39.54</a>	0.215	98.5	<a href="#">26.19</a>	<b>54.0</b>
8	46	90	<b>101.1</b>	<a href="#">27.1</a>	9	<a href="#">39.54</a>	0.169	98.5	<a href="#">24.10</a>	<b>42.4</b>
9	46	120	<b>128.5</b>	<a href="#">21.0</a>	9	<a href="#">39.54</a>	0.069	98.5	<a href="#">16.32</a>	<b>17.3</b>
10	46	150	<b>156.9</b>	<a href="#">17.0</a>	9	<a href="#">39.54</a>	0.282	98.5	<a href="#">28.55</a>	<b>70.8</b>
11	46	180	<b>185.8</b>	<a href="#">14.3</a>	9	<a href="#">39.54</a>	0.459	98.5	<a href="#">32.78</a>	<b>115.2</b>
12	46	220	<b>224.8</b>	<a href="#">11.8</a>	9	<a href="#">39.54</a>	0.632	98.5	<a href="#">35.56</a>	<b>158.6</b>
13	46	260	<b>264.0</b>	<a href="#">10.0</a>	9	<a href="#">39.54</a>	0.687	98.5	<a href="#">36.28</a>	<b>172.4</b>
14	46	300	<b>303.5</b>	<a href="#">8.7</a>	9	<a href="#">39.54</a>	0.787	98.5	<a href="#">37.46</a>	<b>197.5</b>
15	46	340	<b>343.1</b>	<a href="#">7.7</a>	9	<a href="#">39.54</a>	<b>1.000</b>	98.5	<a href="#">39.54</a>	<b>251.0</b>

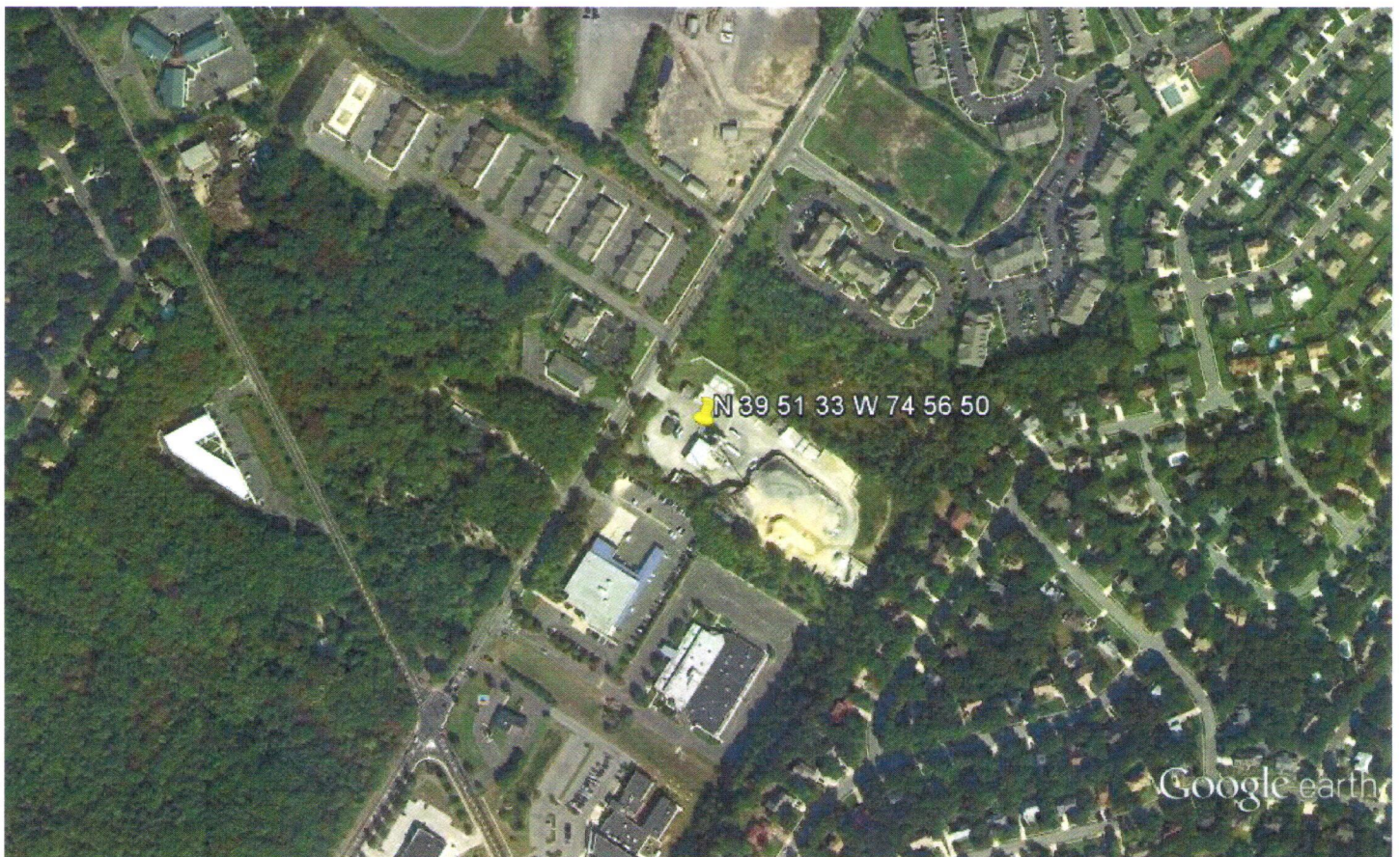
NOTE: Study point at 2 meters above ground level.

Worst-case relative field of 1.000 used for last examined point.

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



FIGURE EE6: AERIAL PHOTO OF PROPOSED TRANSMITTER SITE  
CHERRY HILL, NJ, 279D



Google earth

feet  
meters

1000

600

