

APPLICATION FOR MINOR  
MODIFICATION TO A LICENSED DTV  
BROADCAST STATION WLRN-DT  
FCC FILE NO.: BLEDT-20030311AEF  
TO MAXIMIZE AND OPERATE IN THE POST  
DTV TRANSITION PERIOD  
THE SCHOOL BOARD OF MIAMI - DADE  
COUNTY, FL  
MIAMI, FLORIDA

KESSLER & GEHMAN ASSOCIATES, INC.  
TELECOMMUNICATIONS CONSULTING ENGINEERS

20080604

*Prepared by Ryan Wilhour*

*KG&A*

507 N.W. 60th Street, Suite C  
Gainesville, Florida 32607

## **KESSLER AND GEHMAN ASSOCIATES, INC.**

ENGINEERING STATEMENT OF RYAN WILLOUR OF THE FIRM KESSLER AND  
GEHMAN ASSOCIATES, INC., CONSULTING ENGINEERS IN CONNECTION WITH  
AN APPLICATION FOR MINOR MODIFICATION OF A LICENSED DTV  
BROADCAST STATION WLRN-DT FCC FILE NUMBER BLEDT-20030311AEF TO  
MAXIMIZE OPERATION IN THE POST DTV TRANSITION PERIOD  
THE SCHOOL BOARD OF MIAMI - DADE COUNTY, FL  
MIAMI, FLORIDA

### PROCLAMATION OF ENGINEER

I, Ryan Wilhour, am an associate of Kessler and Gehman Associates, Inc. with offices in Gainesville, Florida. I am a graduate of the University of Florida with a Bachelor of Science degree in electrical engineering.

This firm has been employed by The School Board of Miami-Dade County, FL to prepare engineering studies and a minor modification application to FCC file number BLEDT-20030311AEF for post DTV transition maximization.

### ATTACHED FIGURES

In carrying out the engineering studies the following attached figures were prepared:

1. Engineering Specifications (Exhibit E1)
2. Elevation drawing of the antenna system (Exhibit E2)
3. USGS 7.5 minute topographic quadrangle showing the proposed transmitter location and the coordinate lines (Exhibit E3)
4. Antenna azimuth and elevation patterns (Exhibit E4)
5. Map showing the predicted DTV coverage contour (Exhibit E5)
6. Allocation Analysis (Exhibit E6)
7. Environmental Impact/ RFR Hazard Analysis (Exhibit E7)

NARRATIVE

The School Board of Miami-Dade County, FL noncommercial licensee of WLRN-DT proposes to operate its post-transition Channel 20 digital facility using the existing support structure and antenna height. The instant application proposes to replace the licensed antenna and increase the maximum ERP from 625kW to 1000kW, no other changes are proposed.

ALLOCATION ANALYSIS

It is herein proposed to modify the above referenced channel 20 digital licensed facility to maximize its coverage area without causing impermissible interference to other post DTV transition facilities. Exhibit E6 demonstrates the interference considerations for the proposed facility and further illustrates complete compliance to the 0.5% interference threshold criteria.

ENVIRONMENTAL IMPACT/RFR HAZARD ANALYSIS


An analysis has been made of the human exposure to RFR using the calculation methodology described in OET Bulletin 65, Edition, 97-01. Exhibit E7 is a RFR study demonstrating compliance within 5% of the most restrictive permissible exposure at any location 2 meters above the ground. Exhibit E7 calculations were made using a frequency of 506 MHz, which is the lower edge of the proposed channel. To account for ground reflections, a coefficient of 1.6 was included in the calculations.

Pursuant to OET Bulletin 65 concerning multiple-user transmitter sites only those licensees whose transmitters produce power density levels greater than 5.0% of the exposure limit are considered significant contributors to RFR. Since the proposed operation is well within 5% of the most permissible exposure at any location 2 meters above the ground, it is not considered a significant contributor to RFR exposure. Thus, contributions to exposure from other RF sources in the vicinity of WLRN-DT were not taken into account. The instant proposal complies with the FCC limits for human exposure to RF radiation and thus is excluded from further environmental processing.

**KESSLER AND GEHMAN ASSOCIATES, INC.**

DECLARATION OF ENGINEER

The foregoing statement and the report regarding the aforementioned engineering work are true and correct to the best of my knowledge. Executed on June 4, 2008.

The logo for Kessler and Gehman Associates, Inc. (KGA) features the letters "KGA" in a stylized, serif font. The letters are white and are superimposed on a thick, horizontal gray bar that extends across the width of the logo.

Ryan Wilhour

A handwritten signature in blue ink that reads "Ryan Wilhour". The signature is written in a cursive, flowing style.

Consulting Engineer

WLRN-DT

MIAMI, FLORIDA

ENGINEERING SPECIFICATIONS

A. Transmitter Site (NAD 27)

North Latitude 25 ° 58 ' 46 "

West Longitude 80 ° 11 ' 46 "

Street Address or Location

3300 SW 52<sup>ND</sup> Avenue  
Pembroke Park, Florida

B. Proposed Facility  
DTV Channel

Number 20  
Frequency 506-512 MHz

C. Antenna Height

Height of Site Above Mean Sea Level (AMSL) 3 m

Overall Height of Structure Above Ground 308 m  
(including all appurtenances)

Overall Height of Structure Above Mean Sea Level 311 m  
(including all appurtenances)

Height of Site Above Average Terrain 1 m

Effective Height of Antenna Above Ground 300 m

Effective Height of Antenna Above Average Terrain 301 m

Effective Height of Antenna Above Mean Sea Level 303 m

D. Antenna Parameters – Horizontal Polarization

Maximum Antenna Gain in Beam Maximum 17.32 dBd

Maximum Antenna Gain in Horizontal Plane 15.70 dBd

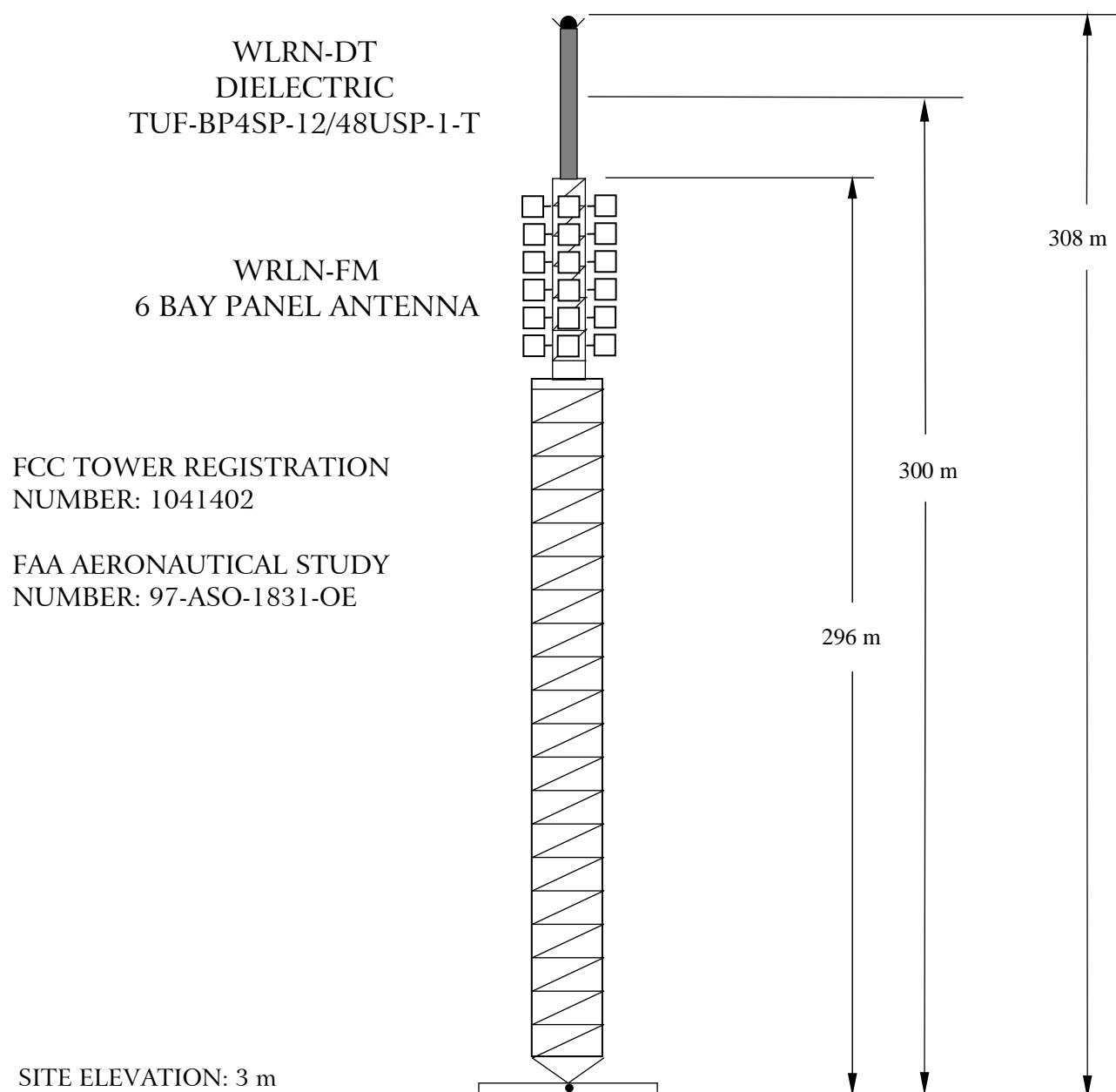
Maximum Effective Radiated Power 1000 kW

In Beam Maximum 30.00 dBk

Maximum Effective Radiated Power 688.7 kW

In Horizontal Plane 28.38 dBk

## ELEVATION VIEW



OVERALL HEIGHT AGL:	308 m
OVERALL HEIGHT AMSL:	311 m
DTV RAD. CTR. AGL:	300 m
DTV RAD. CTR. AMSL:	303 m
DTV RAD. CTR. AAT	301 m
AVERAGE TERRAIN:	2 m

NAD 27 COORDINATES:  
N. LATITUDE 25 °58' 46"  
W. LONGITUDE 80 °11' 46"

NOTE: NOT TO SCALE

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EXHIBIT E2

WLRN-DT

MIAMI, FLORIDA

TABULATION OF RELATIVE FIELD FOR PROPOSED DIRECTIONAL ANTENNA

<u>AZIMUTH</u>	<u>RELATIVE FIELD</u>	<u>AZIMUTH</u>	<u>RELATIVE FIELD</u>
N000°E	0.955	N180°E	0.571
N010°E	1.000	N190°E	0.750
N020°E	0.957	N200°E	0.903
N030°E	0.833	N210°E	0.990
N040°E	0.659	N220°E	0.988
N050°E	0.489	N230°E	0.912
N060°E	0.370	N240°E	0.813
N070°E	0.305	N250°E	0.726
N080°E	0.288	N260°E	0.635
N090°E	0.329	N270°E	0.529
N100°E	0.383	N280°E	0.446
N110°E	0.408	N290°E	0.417
N120°E	0.400	N300°E	0.425
N130°E	0.358	N310°E	0.483
N140°E	0.303	N320°E	0.583
N150°E	0.288	N330°E	0.681
N160°E	0.332	N340°E	0.765
N170°E	0.423	N350°E	0.859

MAXIMUM OF 1.000 AT N010°E, N214°E

ADDITIONAL AZIMUTHS 0.286 AT N147°E AND N078°E, 0.410 AT N112°E, 0.416 AT N291°E

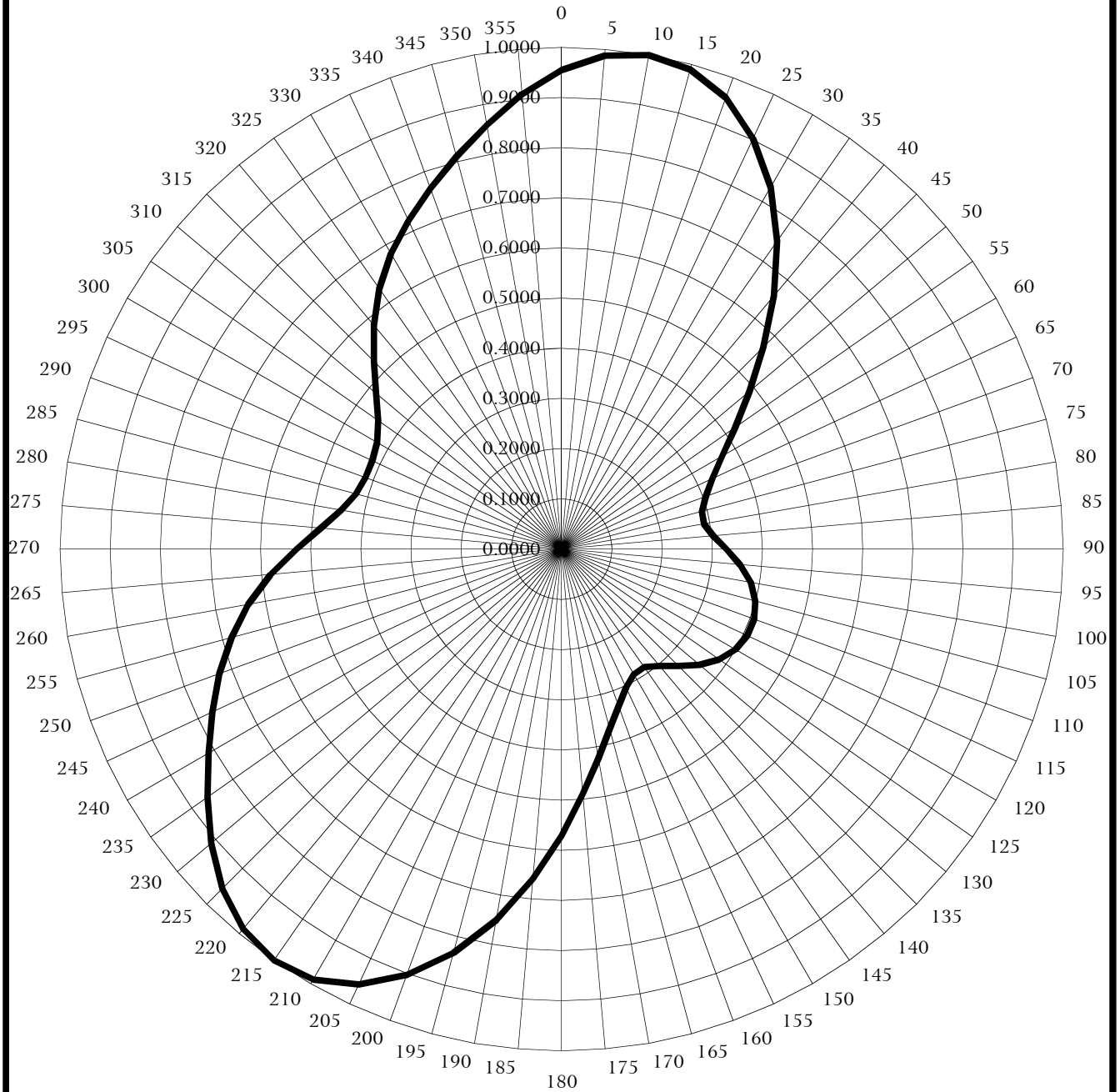
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EXHIBIT E3A

# RELATIVE FIELD AZIMUTH PATTERN



DIELECTRIC - TUF-BP4SP-12/48USP-1-T  
ORIENTED WITH BEAM MAXIMA A 10° AND 214°  
AZIMUTH GAIN: 2.4 (3.80 dBd)

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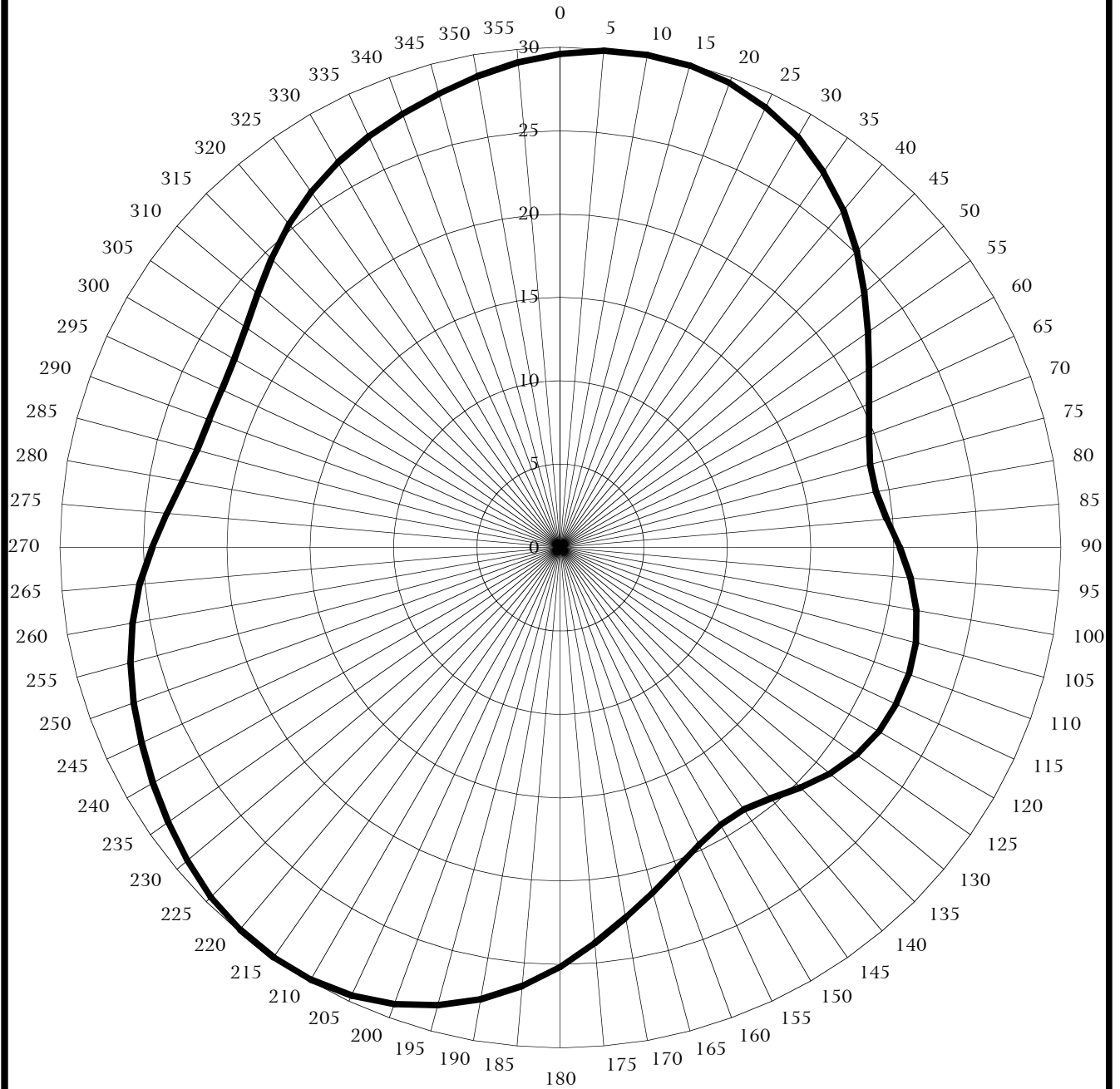
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EXHIBIT E3B



# ERP - dBk



DIELECTRIC - TUF-BP4SP-12/48USP-1-T  
MAXIMUM ERP 1000KW (30 DBK)

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EXHIBIT E3C

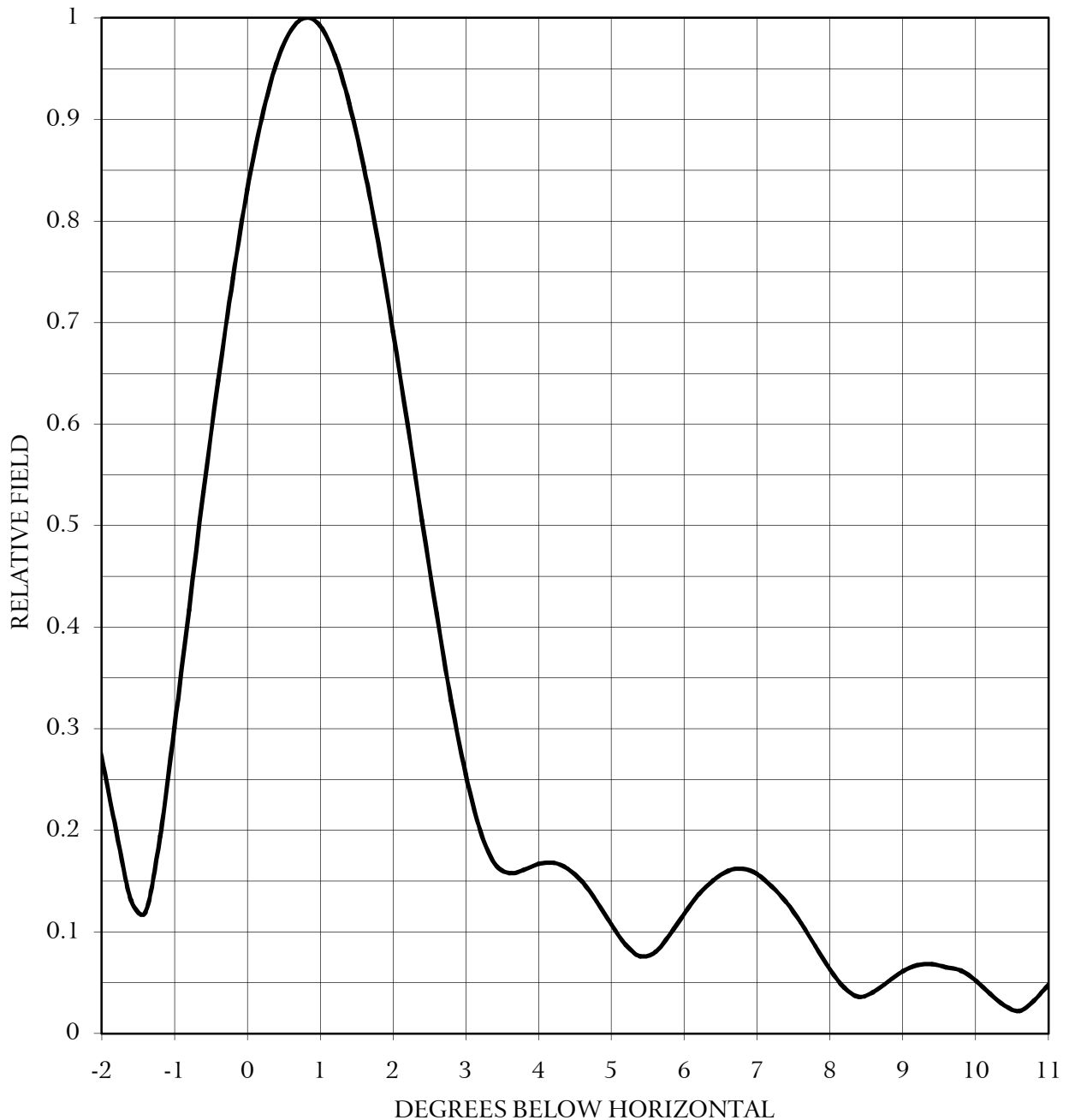
# ELEVATION PATTERN

DIELECTRIC - TUF-BP4SP-12/48USP-1-T

RMS Gain at Main Lobe : 22.50 (13.52 dBd)

RMA Gain at Horizontal: 15.5 (11.90 dBd)

Beam Tilt: 0.80 deg



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EXHIBIT E3D

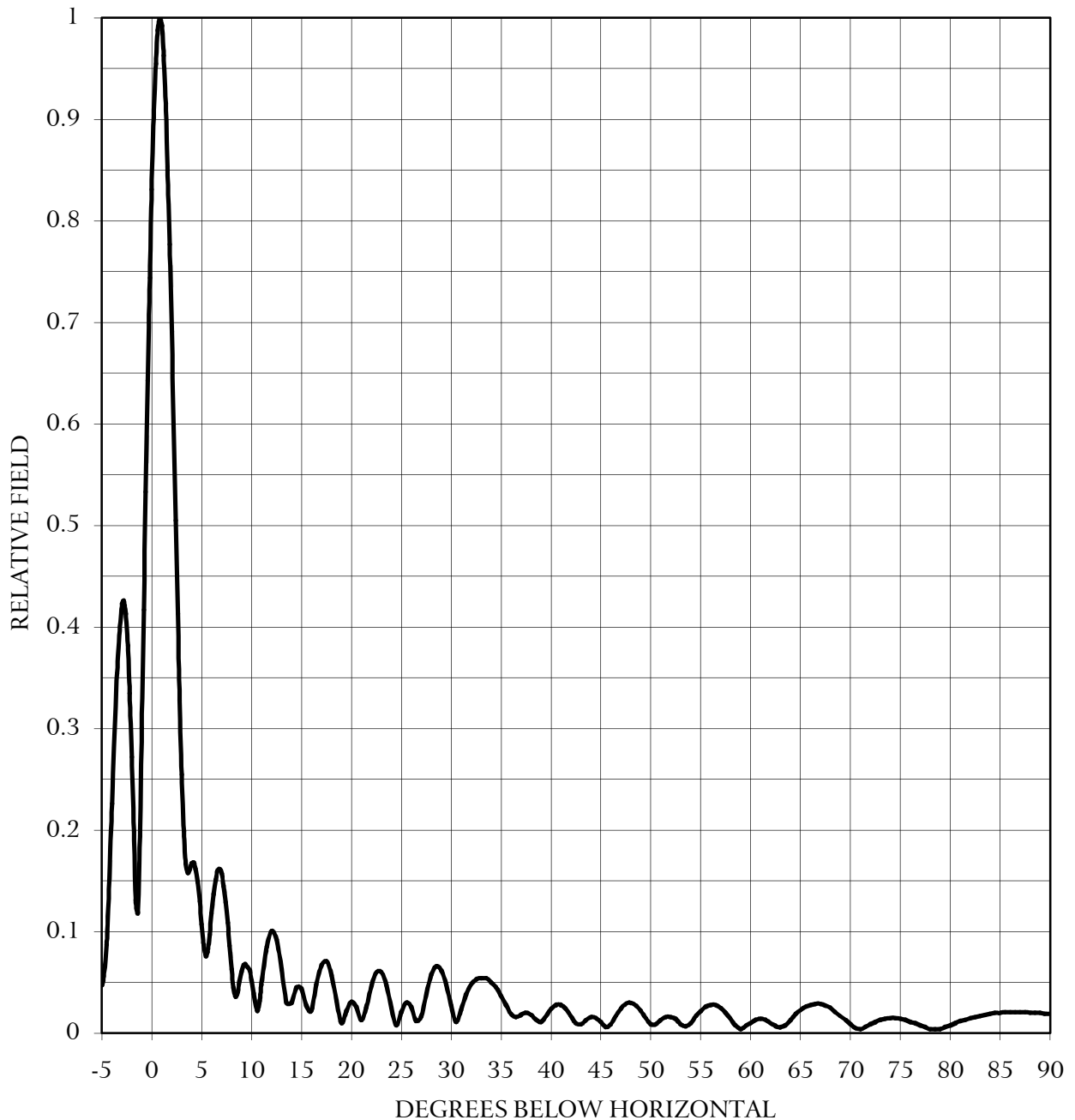
# ELEVATION PATTERN

DIELECTRIC - TUF-BP4SP-12/48USP-1-T

RMS Gain at Main Lobe : 22.50 (13.52 dBd)

RMA Gain at Horizontal: 15.5 (11.90 dBd)

Beam Tilt: 0.80 deg



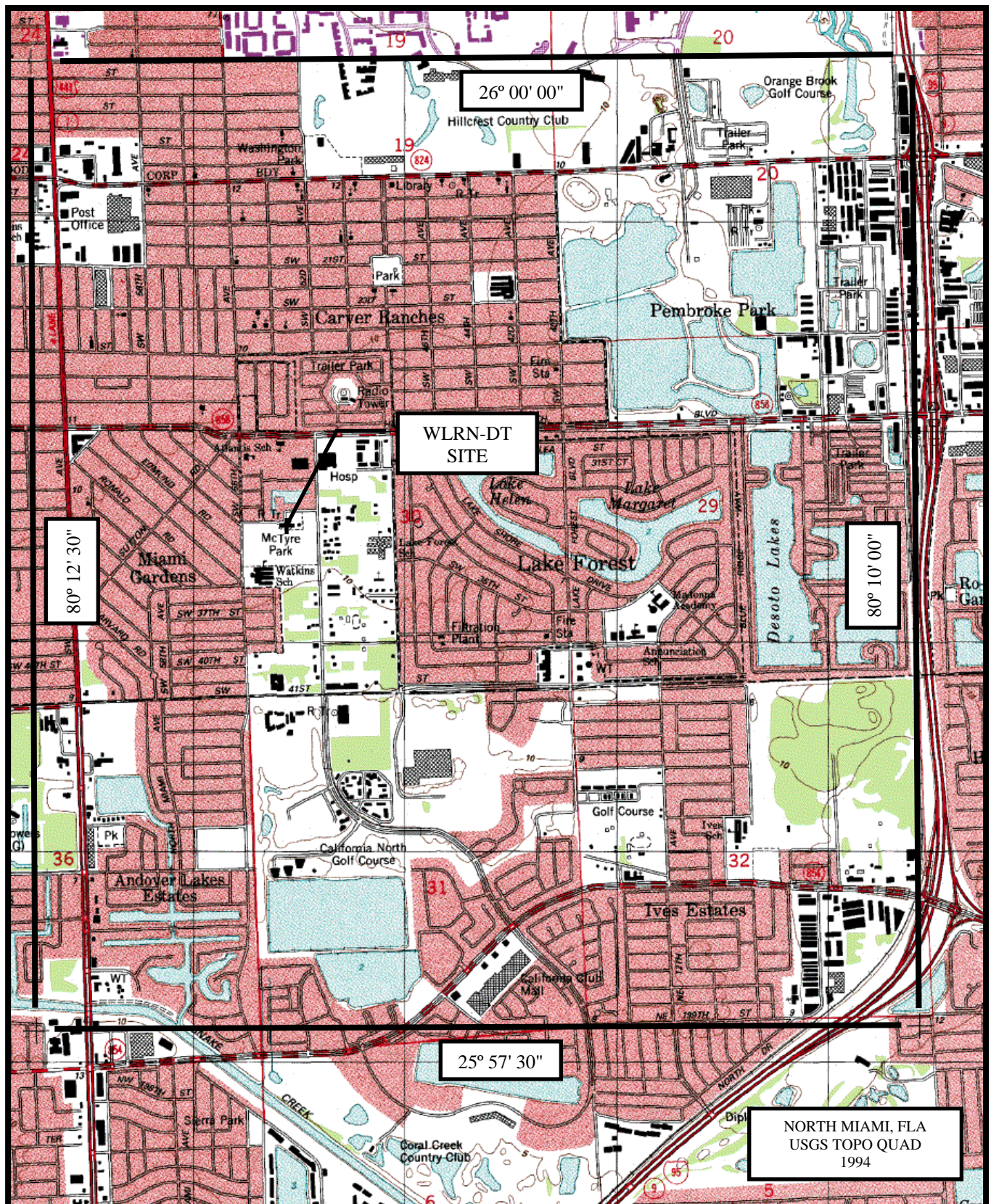
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EXHIBIT E3E





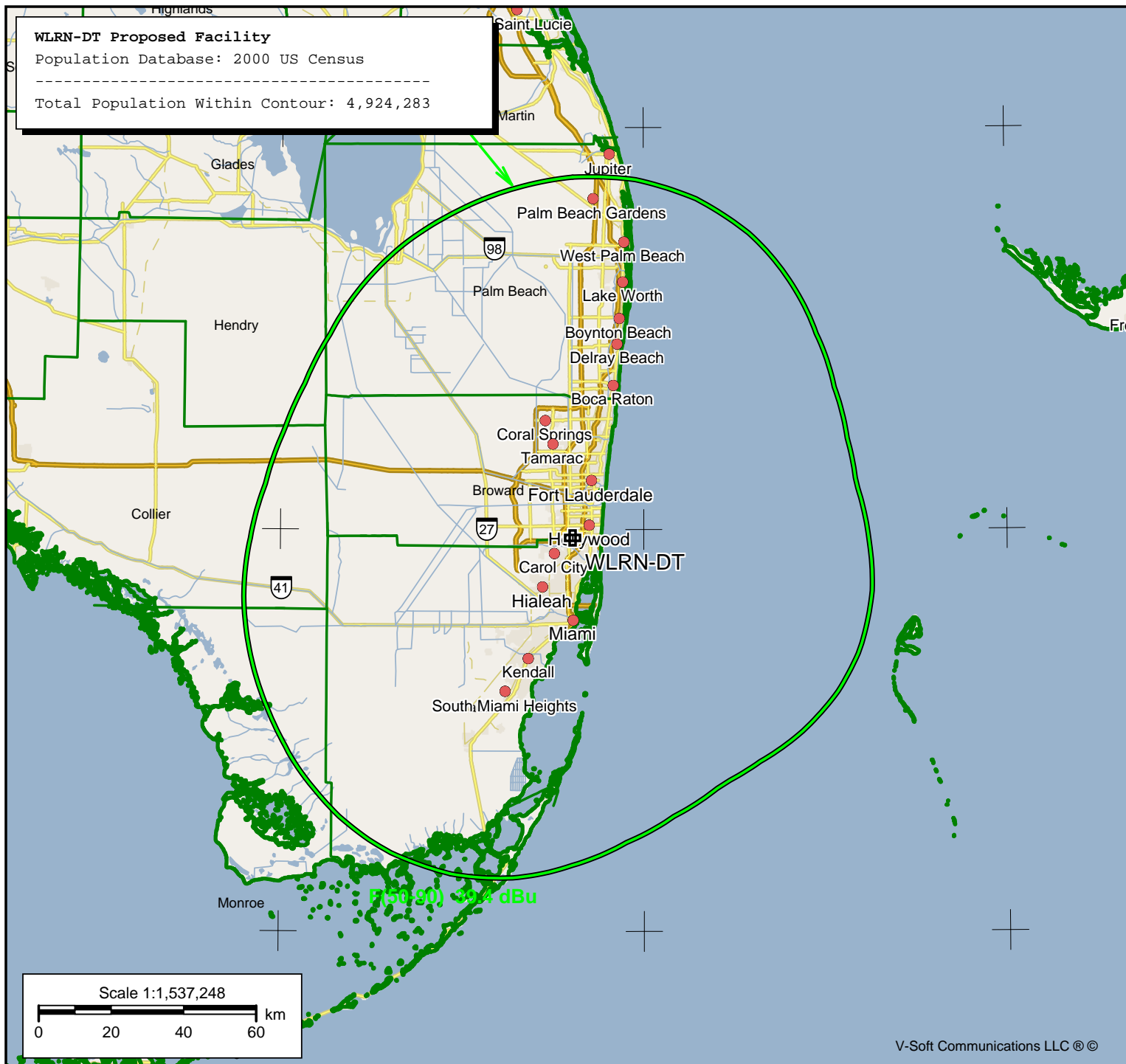
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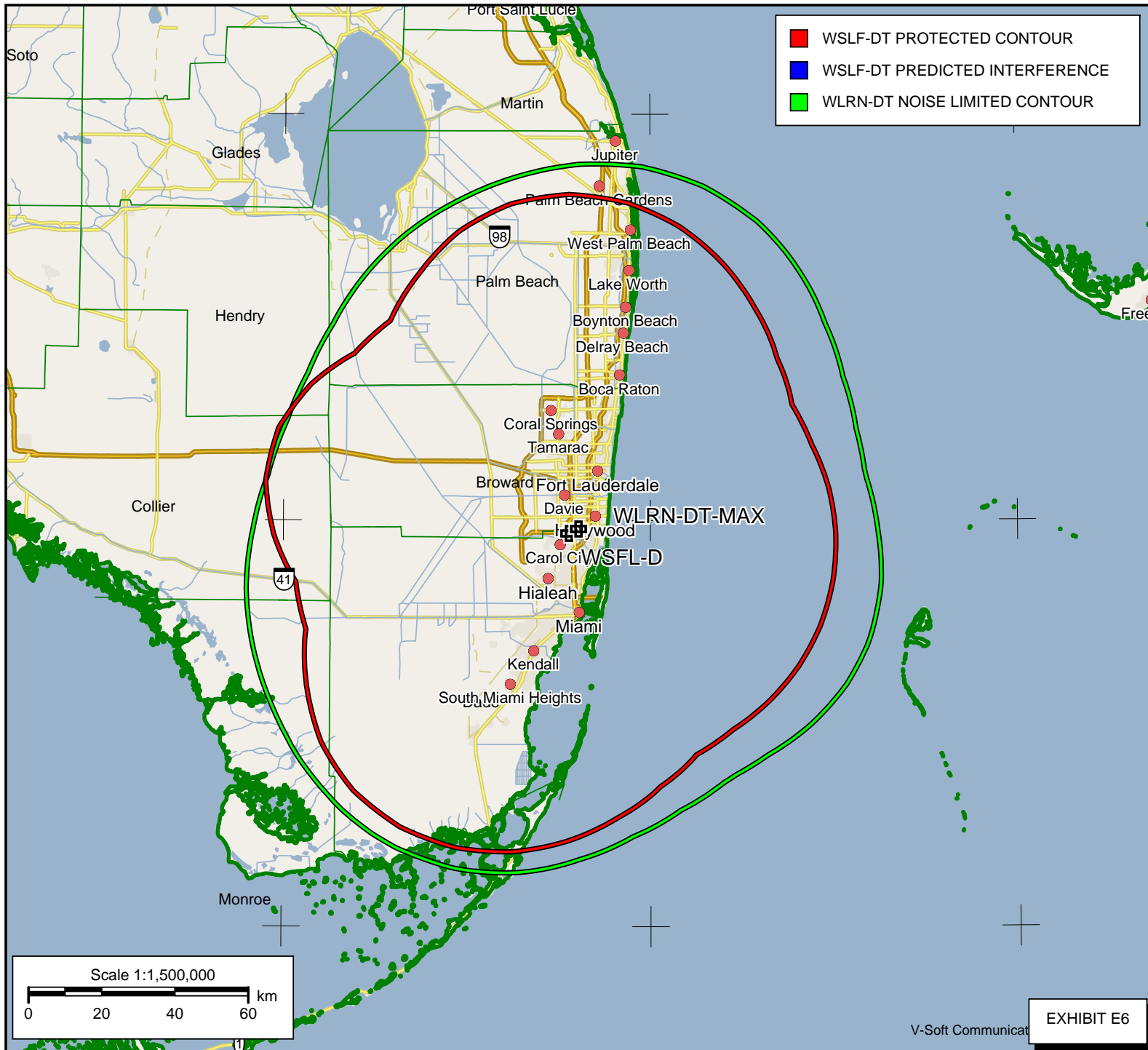
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EXHIBIT E4





**WLRN-DT - Blue Ctr**  
**PROPOSED**  
Latitude: 25-58-46 N  
Longitude: 080-11-46 W  
ERP: 1000.00 kW  
Channel: 20  
AMSL Height: 303.0 m  
HAAT: 301.0 m  
Horiz. Pattern: Directional  
Vert. Pattern: Yes  
Elec Tilt: 0.8  
Prop Model: None

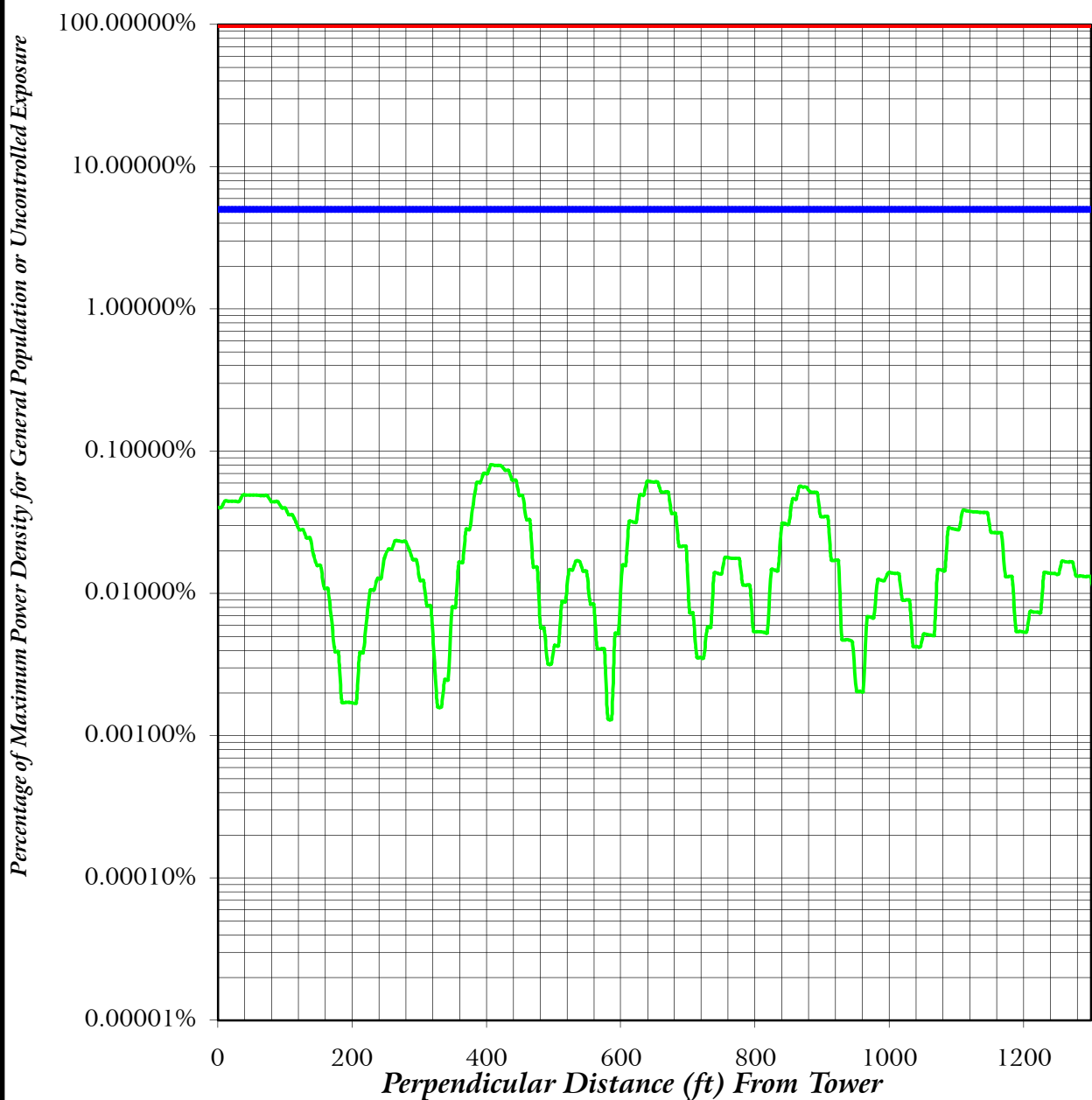


- WSLF-DT PROTECTED CONTOUR
- WSLF-DT PREDICTED INTERFERENCE
- WLRN-DT NOISE LIMITED CONTOUR

**WLRN-DT-MAX**  
MAXIMIZED  
Latitude: 25-58-46 N  
Longitude: 080-11-46 W  
ERP: 1000.00 kW  
Channel: 20  
Frequency: 509.0 MHz  
AMSL Height: 303.0 m  
Elevation: 3.0 m  
Horiz. Pattern: Directional  
Vert. Pattern: Yes  
Elec Tilt: 0.8  
Prop Model: Longley/Rice  
Climate: Cont temperate  
Conductivity: 0.0050  
Dielec Const: 15.0  
Refractivity: 301.0  
Receiver Ht AG: 10.0 m  
Receiver Gain: 0 dB  
Time Variability: 90.0%  
Sit. Variability: 50.0%  
ITM Mode: Broadcast

**WSFL-D**  
  
Latitude: 25-58-07 N  
Longitude: 080-13-20 W  
ERP: 1000.00 kW  
Channel: 19  
Frequency: 503.0 MHz  
AMSL Height: 241.0 m  
Elevation: 3.0 m  
Horiz. Pattern: Directional  
Vert. Pattern: Yes  
Elec Tilt: 0.0  
Prop Model: Longley/Rice  
Climate: Cont temperate  
Conductivity: 0.0050  
Dielec Const: 15.0  
Refractivity: 301.0  
Receiver Ht AG: 10.0 m  
Receiver Gain: 0 dB  
Time Variability: 90.0%  
Sit. Variability: 50.0%  
ITM Mode: Broadcast

# FAR FIELD EXPOSURE TO RF EMISSIONS



- Maximum Allowable General Population or Uncontrolled Exposure
- 5 % of Maximum General Population or Uncontrolled Exposure
- Percentage of Maximum General Population or Uncontrolled Exposure

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EXHIBIT E7



METHODOLOGY AND EXPLANATION OF  
ENVIRONMENTAL IMPACT / RADIO FREQUENCY RADIATION  
HAZARD ANALYSIS

A theoretical analysis has been conducted of the human exposure to radio frequency radiation ("RFR") using the calculation methodology described in *OET Bulletin 65, Edition 97-01*. The RFR analysis is conducted pursuant to the following methodology:

Terrain<sup>1</sup> extraction is compiled from the proposed tower site to radial lengths of 0.25 miles in 0.001 mile increments for 360 radials. The power density is calculated for each terrain point at 6 feet above ground level using the elevation and azimuth pattern of the proposed broadcast antenna. The power density calculations are conducted using the lower edge of the proposed channel frequency. To account for ground reflections, a coefficient of 1.6 was included in the calculation.

The resulting cylindrical polar analysis is then summarized into a coordinate plane graph using the following methodology:

Starting from the origin the maximum calculated RFR value is determined among the 360 degree radials for each 0.001 mile increment, the value is then converted into a percentage of the maximum allowable general population or uncontrolled exposure and plotted as a function of perpendicular distance from the tower.

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<sup>1</sup> Terrain extraction is based upon a 3 arc second point spacing terrain database.