

## ENGINEERING STATEMENT

On behalf of  
Hope Christian Church of Marlton, Inc.

Application for a Minor Change

Station WVBV  
Medford Lakes, New Jersey  
File No. BNPED-20000229AAL

Charles W. Loughery  
532 Ridge Road  
Telford, Pennsylvania 18969  
Tel: (215) 453-6543

## DECLARATION OF CHARLES W. LOUGHERY

I hereby declare:

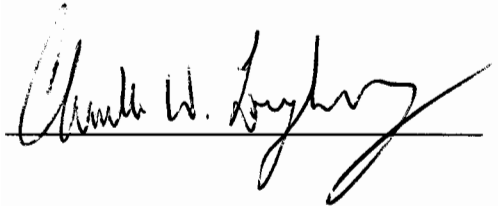
That I assisted in the preparation of the attached engineering Section VII and related exhibits as an amendment to BNPED-20000229AAL on behalf of Hope Christian Church of Marlton, Inc., applicant for a minor change to WVBV, a Noncommercial Educational FM station at Medford Lakes, New Jersey.

That I have been involved in radio and television broadcast engineering for 29 years and have prepared and submitted engineering and related documents for filing with the Commission since 1979.

That I hold a General Class Radiotelephone License (since 1977).

That all statements contained within these engineering sections of form 340 and related exhibits are true and accurate to the best of my knowledge and belief, and as to statements made of belief, they are believed to be true, except for information for which the Federal Communications Commission takes official notice.

October 29, 2004

A handwritten signature in black ink, appearing to read 'Charles W. Loughery', is written over a horizontal line.

Charles W. Loughery  
532 Ridge Road  
Telford, Pennsylvania 18969

William C. Luebkekmann, Jr.  
33 Tinsmith Lane  
Marlton, New Jersey 08053  
Tel: (856) 983-8844

DECLARATION OF WILLIAM C. LUEBKEMANN, JR.

I hereby declare:

That I assisted in the preparation of the attached engineering Section VII and related exhibits as an amendment to BNPED-20000229AAL on behalf of Hope Christian Church of Marlton, Inc., applicant for a minor change to WVBY, a Noncommercial Educational FM station at Medford Lakes, New Jersey.

That I have been involved in radio and television broadcast engineering on an intermittent basis for 30 years and have prepared and submitted engineering and related documents for filing with the Commission since 1999.

That I hold a BS in Electrical Engineering from Drexel University (1980) and a General Class Radiotelephone License (since 1978).

That all statements contained within these engineering sections of form 340 and related exhibits are true and accurate to the best of my knowledge and belief, and as to statements made of belief, they are believed to be true, except for information for which the Federal Communications Commission takes official notice.

October 29, 2004

A handwritten signature in cursive script, appearing to read "Will C. Luebkekmann, Jr.", is written over a horizontal line.

William C. Luebkekmann, Jr.  
33 Tinsmith Lane  
Marlton, New Jersey 08053

James M. Smith  
6 Surrey Court  
Marlton, New Jersey 08053  
Tel: (856) 983-1055

DECLARATION OF JAMES M. SMITH

I hereby declare:

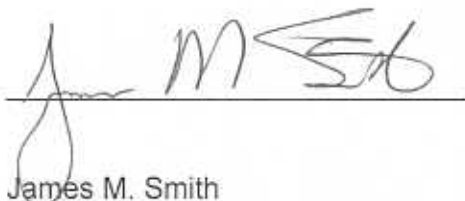
That I assisted in the preparation of the attached engineering Section VII and related exhibits as an amendment to BNPED-20000229AAL on behalf of Hope Christian Church of Marlton, Inc., applicant for a minor change to WVBV, a Noncommercial Educational FM station at Medford Lakes, New Jersey.

That I have been involved in radio and television broadcast engineering for 2 years and have assisted in the preparation and submission of engineering and related documents for filing with the Commission since 2003.

That I hold a BS in Electrical Engineering from Rutgers University (1993) and an MS in Computer Science and Engineering from Clemson University (1995).

That all statements contained within these engineering sections of form 340 and related exhibits are true and accurate to the best of my knowledge and belief, and as to statements made of belief, they are believed to be true, except for information for which the Federal Communications Commission takes official notice.

October 29, 2004

A handwritten signature in dark ink, appearing to read 'JMS', is written over a horizontal line.

James M. Smith  
6 Surrey Court  
Marlton, New Jersey 08053

## Facilities Proposed

The facilities are as proposed in Section VII, questions 1 – 11, and the proposed changes are Minor as defined by the rules. This proposal complies with 47 CFR §73.509 and 47 CFR §73.525. See the attached Engineering Exhibit for details of the facility proposed and demonstration of compliance with all applicable rules.

Using conventional contour protection (without considering the antenna vertical elevation pattern) as specified in 47 CFR §73.509, this application fully protects all authorized and previously cutoff proposals operating co-channel, first, second and third adjacent with the exception of WHY-FM and WRTI, both in Philadelphia. However, using the procedures outlined in 47 CFR §73.313(c)(2) and considering the vertical elevation pattern of the proposed antenna, this application fully complies with 47 CFR §73.509 and protects both WHY-FM and WRTI because the 100 dBu contour does not extend to a height 9 meters above ground level. This will be discussed in greater detail below. Attached as Figures 6-8 are allocation study maps showing compliance pursuant to 47 CFR §73.509.

A detailed showing with regard to 47 CFR §73.509 will clearly demonstrate that no overlap to the two second adjacent 60 dBu coverage areas will occur because the area of overlap occurs at a height of 30 meters, well above both the 9 meter height at which the Commission evaluates overlap and the 11 meter structure limit imposed by New Jersey State Law.

47 CFR §73.509(e) permits overlap over water as an uninhabitable space, while this proposal results in overlap in the sky well above ground, a similarly uninhabitable space.

Additionally, this application protects the facilities of Station WWFP, Brigantine, New Jersey, as proposed in the simultaneously-filed application of CSN International to modify the construction permit for that station. A Contingent Application Agreement between CSN and Hope Christian Church of Marlton, Inc. is attached as Exhibit 1. Under section 47 CFR §73.3517(e), the Commission may consider CSN's proposed rather than its authorized facilities in passing upon this application.

Application BNPED-20000412ADC, Hammonton, New Jersey, has already been ruled as untimely filed by the Commission and can be ignored.

Figures 4-5 are a polar plot and tabulation of the proposed azimuth DA pattern. Figures 9-10 are a plot and tabulation of the proposed elevation pattern.

**ENGINEERING EXHIBIT**  
**Hope Christian Church of Marlton, Inc.**  
**Station WVBV**  
**Application for Minor Changes**  
**Medford Lakes, New Jersey**

This application is being filed due to loss of the site specified in the current CP and will state with particularity the facts and circumstances which warrant its acceptance.

This Exhibit consists of the following components:

- 1) Details regarding the loss of original site
- 2) Preclusion study – based upon available transmitter sites
- 3) Preclusion study – based on all 20 non-commercial channels
- 4) Alternate showing – demonstrating compliance with 47 CFR §73.509
- 5) Request for waiver of 47 CFR §73.509 to the extent necessary to permit an alternate showing of compliance.

The applicant currently holds a construction permit for Non-Commercial Educational station WVBV, Medford Lakes, New Jersey. Reasonable assurance of site availability was obtained prior to making application for the construction permit by arranging to co-locate on a new communications tower to be built by Verizon Wireless, the location of which was ideal to provide service to our city of license. This type of cellular tower is generally permitted in the New Jersey Pinelands.

Subsequent to that and due to the particular and unique situation in the New Jersey Pinelands, which will be explained in detail in a later section of this application, it has become impossible for Verizon Wireless to acquire the necessary zoning approvals to begin construction. A number of court cases are pending, but given the wide statutory latitude afforded the New Jersey Pinelands Commission on a state and federal level, settlement and/or accommodation is highly unlikely. At this time it is highly unlikely that this tower will be built at or near the original location, or within a time frame which would accommodate construction of WVBV, making it no longer suitable for the applicant's purposes.

Having lost the use of its FCC-authorized site, the applicant has undertaken a careful, comprehensive search for a replacement site. Additionally, a search of all twenty (20) non-commercial educational channels was undertaken to determine the potential for use of a more suitable channel. As shall be shown, there are no other sites or channels available.

The applicant is severely impacted by transmitter site restrictions imposed as a result of the New Jersey Pinelands and related protection of the same. This is discussed below in detail as part of an Area to Locate study. Some potential sites simply cannot provide coverage to Medford Lakes due to the Commission's 15 dB maximum to minimum rule and 2 dB per ten degree rule, both of which are covered under 47 CFR §73.316. Yet others are precluded under the Pinelands Preservation Act, an Act passed by Congress and unique to this area.

The applicant can construct a facility that does not result in prohibited contour overlap if it is permitted to demonstrate compliance in a three dimensional study. Contour overlap studies are usually done two dimensionally, however the applicant can find nothing in the rules that would preclude the use of a three dimensional demonstration of compliance with 47 CFR §73.509.

## Preclusion Study Area to Locate Transmitter

Upon realizing the original site would not be available, the applicant began a comprehensive search for another location to construct a tower. The city of license is Medford Lakes, New Jersey with reference coordinates of N 39-51-30 and W 74-48-12. In order to establish or construct a broadcast facility that serves the city of license and that *does not interfere* with existing broadcast stations, that facility must be located in the crescent-shaped Area to Locate depicted in Figure 1. This area is outside of the interfering 40 dBu contour of the following co-channel stations: WBJB, WWFP, WXGN and WKHS. It is also outside of the interfering 54 dBu contour of 1<sup>st</sup> adjacent station WYRS and the protected, non-interfering 60 dBu contour of 2<sup>nd</sup> adjacent stations WRTI and WHYY-FM.

As will be shown in the following sections, construction of a new broadcast facility in the Area to Locate is specifically prohibited by both Federal and New Jersey State law. As will also be shown, existing facilities within the Area to Locate are unsuitable due to the interference that would result from their location, and/or their inability to serve the city of license.

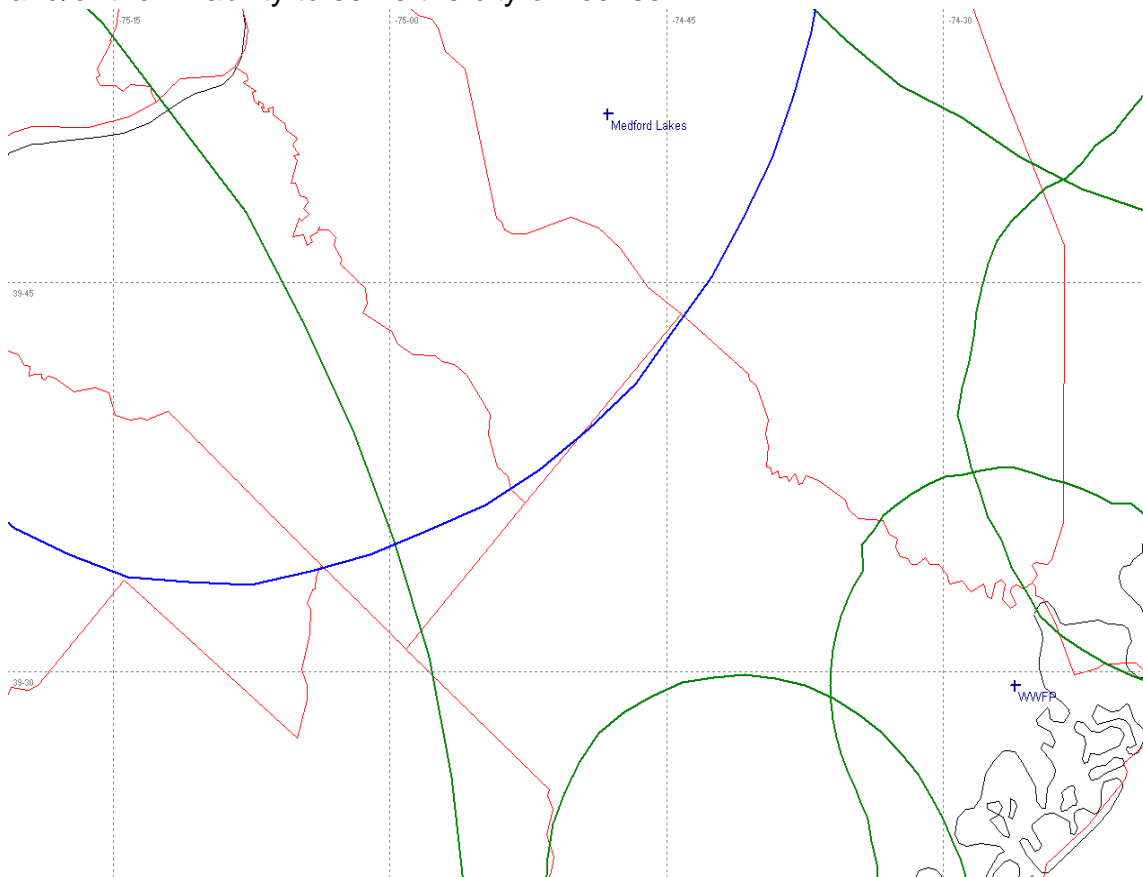


Figure 1: Area to Locate - WVBV, Medford Lakes, New Jersey

## **A. Construction of New Facilities**

The following sections demonstrate why it is not possible to construct a new broadcast facility within the Area to Locate depicted in Figure 1.

### The New Jersey Pinelands National Reserve

The Pinelands National Reserve consists of approximately 1.1 million acres in southern New Jersey. It represents 22% of the state's total land area, has an average population density less than 10 persons per square mile in the interior, and includes portions of seven counties (Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, and Ocean), and all or parts of 56 municipalities. The New Jersey Pinelands is so unique that the United States Congress actually created a new category for it, establishing in 1978 the Pinelands National Reserve as the country's first National Reserve.

In the Pinelands National Reserve, specific areas have been designated for environmental protection, forestry and agriculture. As a United States Biosphere Reserve, the Pinelands also serves as a laboratory for fostering a harmonious relationship between humans and their environment through a program of research that integrates the social, physical and biological sciences. As provided in the federal law, New Jersey Governor Brendan T. Byrne established the Pinelands Commission by executive order on February 8, 1979 and gave it the responsibility of evaluating the Pinelands' resources and planning how best to balance their protection with new development.

The New Jersey Legislature, at Governor Byrne's request, supplemented the federal law by passing the Pinelands Protection Act in June, 1979. The Act affirmed the limitations on development which the Governor had put into effect. It also established a requirement that all county and municipal master plans and land use ordinances be brought into conformance with the Pinelands Comprehensive Management Plan. The Protection Area Plan was adopted on November 21, 1980 and became effective under state law on January 14, 1981. This final version also constituted the Comprehensive Management Plan for the entire Pinelands National Reserve. It was approved by United States Secretary of the Interior Cecil D. Andrus on January 16, 1981.

The Pinelands Comprehensive Management Plan (also referred to as the “CMP”) subdivides the Pinelands National Reserve into the following Pinelands Management Areas (also referred to as “PMAs”):

1. Preservation Area Districts
2. Forrest Areas
3. Agricultural Production Areas
4. Rural Development Areas
5. Regional Growth Areas
6. Pinelands Towns
7. Military and Federal Installation Areas
8. Pinelands Villages
9. Special Agricultural Production Areas

The overall distribution of these areas is shown in Figure 2, the New Jersey Pinelands Land Capability Map.

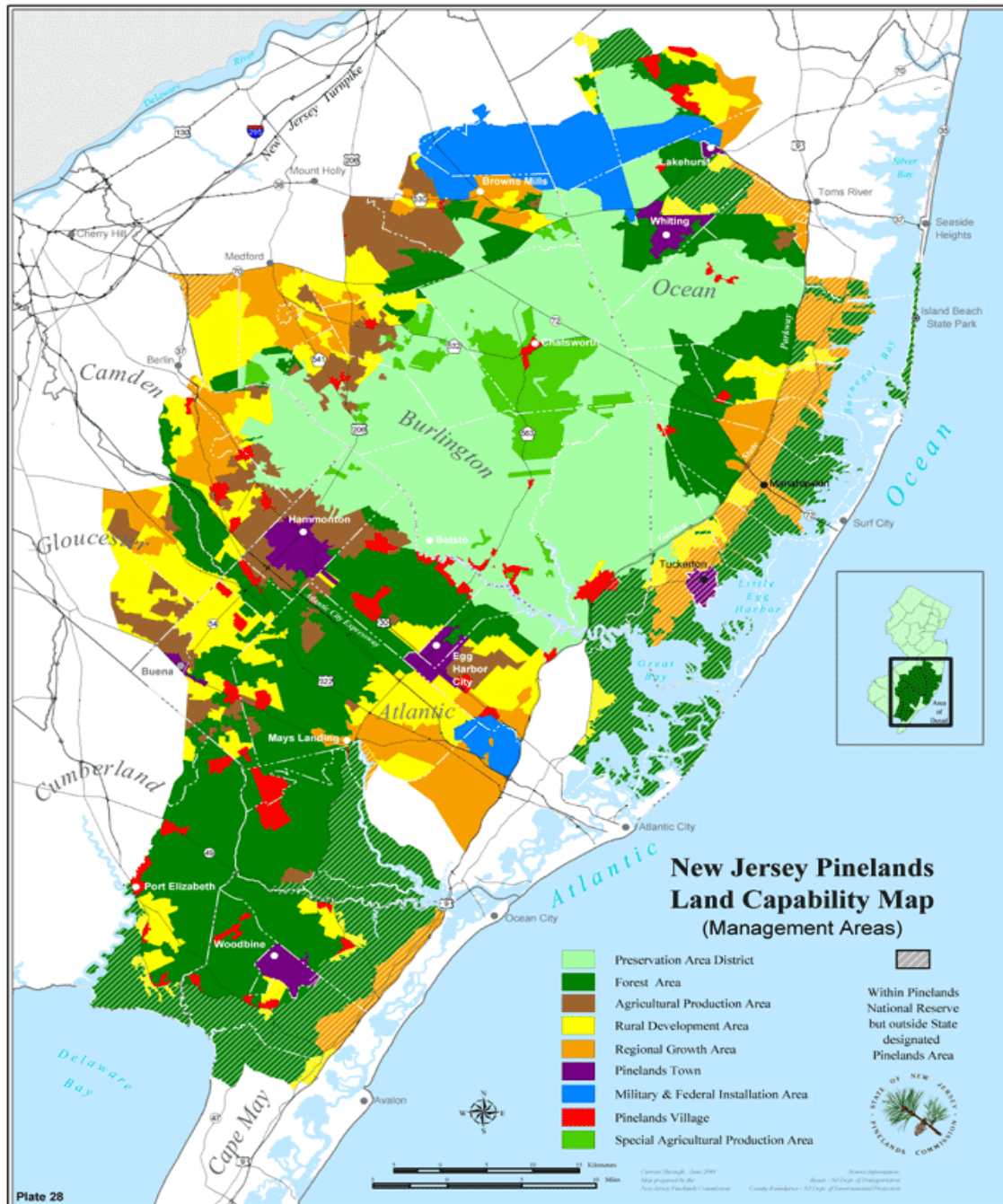


Figure 2: New Jersey Pinelands Land Capability Map

The CMP states that in all Pinelands Management Areas other than Regional Growth Areas and Pinelands Towns, provisions for “local communications facilities” are provided, so long as they meet the standards set forth in N.J.A.C. 7:50-5.4(c). With respect to Regional Growth Areas and Pinelands Towns, however, the Comprehensive Management Plan additionally states:

“It is also recognized that a municipality, county, State or Federal agency may adopt more restrictive regulations, provided that such regulations are compatible with the goals and objectives of this Plan [*the CMP*]. In such cases, all development must adhere to the more restrictive regulations.” [N.J.A.C. 7:50-5].

Therefore, Pinelands Towns and Regional Growth Areas are subject to regulatory restrictions that must meet or exceed the stringency of the Comprehensive Management Plan. Thus, the provision for “local communications facilities” as set forth in N.J.A.C. 7:50-5.4(c) serves as the minimally restrictive set of regulations governing local communications facilities in *all Pinelands Management Areas*.

The Comprehensive Management Plan defines “local communications facilities” as follows:

“‘Local communications facility’ means an antenna and any support structure, together with any accessory facilities, which complies with the standards in N.J.A.C. 7:50-5.4 and which is intended to serve a limited, localized audience through point to point communication, including cellular telephone cells, paging systems and dispatch communications. **It does not include radio or television broadcasting facilities or microwave transmitters.**” [N.J.A.C. 7:50-2.11, emphasis added.]

The construction of a new broadcast station tower is thus specifically excluded in the Comprehensive Management Plan definition of “local communications facility.”

Therefore, since only “local communications facilities” are permitted within the Pinelands Management Areas, and a broadcast station tower does not meet the Comprehensive Management Plan definition of a “local communications facility”, the construction of such a tower is not permitted within the Pinelands Management Areas, *i.e.*, anywhere in the colored-in areas shown on the map reproduced as Figure 2..

To show the extent of preclusion due to Pinelands laws and regulations, the next diagram, Figure 3: Composite Area to Locate, shows the Area to Locate in Figure 1 overlaid with the Pinelands Management Area designations shown in Figure 2.

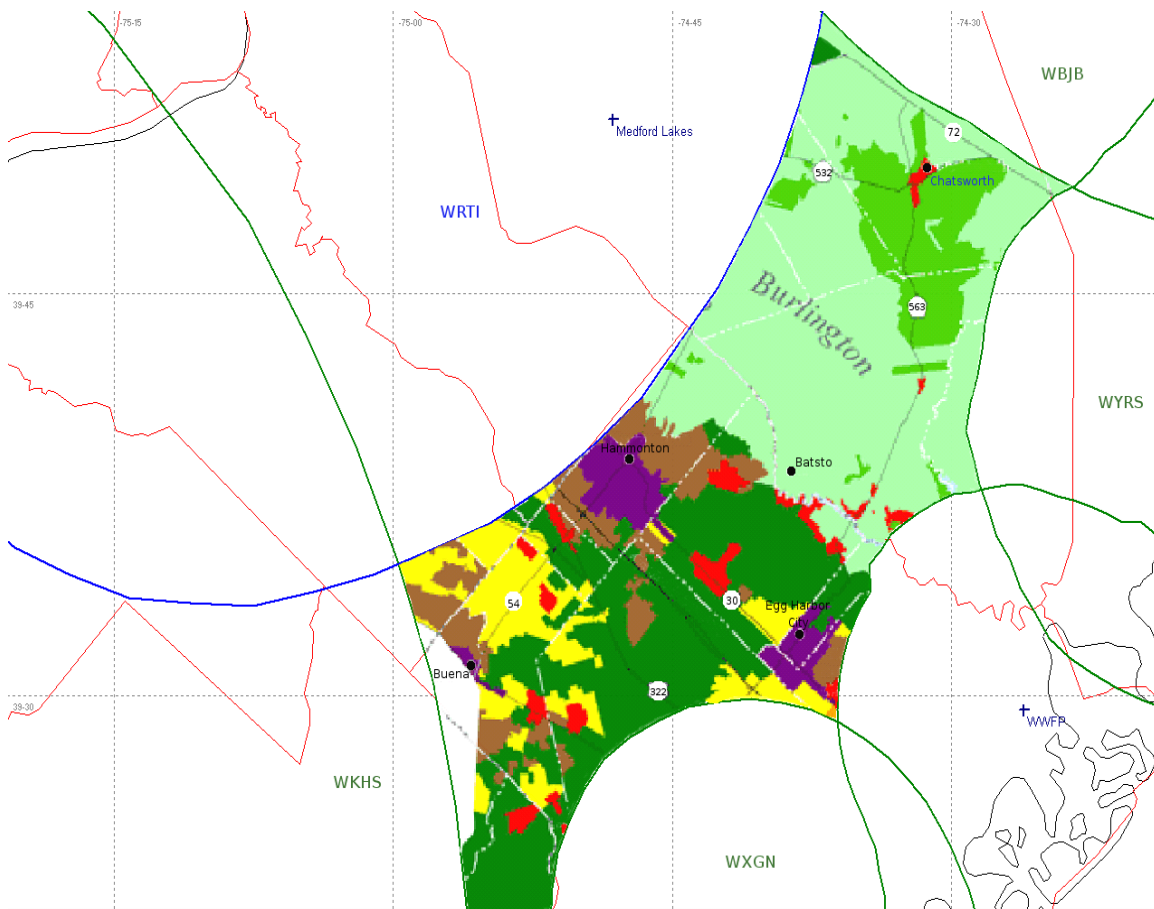


Figure 3: Composite Area to Locate - WVBV, Medford Lakes, New Jersey

As can be seen on Figure 3, the vast majority of the Area to Locate is excluded as a potential construction site, as it directly overlaps the Pinelands Management Areas. One small portion of the Area to Locate does not fall within the PMAs, and is located to the southwest of Buena, New Jersey. However, this area is too far south of Medford Lakes to be feasible. The most favorably placed tower location in this area would result in a maximum output power insufficient for the 60 dBu contour to reach the city of license. (See next section for additional explanation.)

As has been shown under both Federal and New Jersey State Law, it is not possible to construct a new broadcast station facility within the Pinelands Management Areas, nor is it feasible to construct a non-interfering broadcast station within the small percentage of the Area to Locate not located within the Pinelands Management Areas.

## **B. Co-Location with Existing Facilities**

The Pinelands Management Areas were established on January 16, 1981. Currently, its area is approximately 1/3 publicly owned, and 2/3 privately owned. All new development, whether public or private, is now subject to the Comprehensive management plan. Existing development, however, was permitted to remain in place.

As shown in Section A, Construction of New Facilities, the provision for “local communications facilities” as set forth in N.J.A.C. 7:50-5.4(c) serves as the minimally restrictive set of regulations governing local communications facilities in all Pinelands Management Areas. This definition specifically excludes broadcast and microwave facilities, but does permit facilities “intended to serve a limited, localized audience through point to point communication, including cellular telephone cells, paging systems and dispatch communications.” [N.J.A.C 7:50-2.11] Thus, some two way, cellular and paging facilities have been permitted under the CMP.

The following table shows all of the FCC registered towers that were constructed prior to the creation of the PNR/CMP, as well as those that were built in accordance with N.J.A.C. 7:50-5.4(c). The applicant has studied each tower carefully and determined that none of them are suitable for construction of this station due to both their location and the inability to cover the city of license with a 60 dBu signal.

In each case, an antenna height of 10% less than the tower height was used, although other heights on the same tower always produced similar results. An optimal antenna pattern was developed that incorporated the maximum permitted ratio of maximum to minimum power in accordance with 47 CFR §73.510. The maximum power toward Medford Lakes was calculated based on the required protections of existing co-channel and 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> adjacent channels. The use of each and every tower was precluded by the inability to run enough power to cover the city of license with a 60 dBu signal.

The table below shows each tower, its location and the co-channel or adjacent station with the greatest impact on the amount of power that could be run from that site.

Tower ASR =====	Latitude =====	Longitude =====	Primary Limiting Station =====
1040066	39-31-09	74-41-35	co-channel WXGN
1045048	39-33-18	74-42-52	co-channel WXGN
1045799	39-38-41	74-49-31	2 <sup>nd</sup> adjacent WRTI
1045851	39-51-52	74-32-25	co-channel WBJB-FM
1045852	39-26-13	74-52-06	co-channel WXGN
1046923	39-50-34	74-32-40	co-channel WBJB-FM
1046959	39-37-33	74-47-44	co-channel WWFP
1046968	39-36-06	74-44-57	co-channel WXGN
1048339	39-37-31	74-47-23	co-channel WWFP
1049923	39-32-49	74-38-19	co-channel WXGN
1055074	39-32-59	74-44-07	co-channel WXGN
1058659	39-37-58	74-48-16	co-channel WWFP
1061417	39-37-04	74-51-16	2 <sup>nd</sup> adjacent WRTI
1061710	39-33-20	74-44-48	co-channel WXGN
1064293	39-51-52	74-32-41	co-channel WBJB-FM
1210719	39-39-02	74-47-27	co-channel WWFP
1210857	39-40-16	74-46-27	2 <sup>nd</sup> adjacent WRTI
1212215	39-28-52	74-50-58	co-channel WXGN
1237802	39-51-51	74-32-24	co-channel WBJB-FM

As shown in the table, no existing facilities meet the requirement of covering the city of license, without causing considerable interference to one or more of the surrounding broadcast stations.

**Preclusion Study  
Of All 20 Non-Commercial Channels  
Showing That Only Channel 213  
Is Available to Serve the City of License**

Having failed to locate a suitable site, the applicant undertook a study of all 20 non-commercial channels to see if another channel might be suitable for coverage of the city of license. The fact that there is currently a freeze on the filing of major changes is irrelevant since it has been shown that none of the channels will work.

**Method**

Beginning with the previously mentioned reference coordinates of the city of license, N 39-51-30 and W 74-48-12, each channel was evaluated using 0.1 kW at 30 meters (the minimum required for an omni-directional class A station). The reference coordinates of the city of license cannot be inside the interfering contour of any other station because that would force the protected contour to intersect that interfering contour (see 47 CFR §73.509).

**Study**

The results of the study show that the city of license coordinates are inside of the:

<u>Channel</u>	<u>City of License Reference Coordinates Inside:</u>
201	40 dBu contours of co-channel WNJS & WNJT
202	54 dBu contours of 1 <sup>st</sup> adjacent WNJS & WNJT
203	54 dBu contour of co-channel WXPB
204	54 dBu contour of 1 <sup>st</sup> adjacent WBZC (CP and license) 54 dBu contour of 1 <sup>st</sup> adjacent WXPB
205	40 dBu contour of co-channel WBZC (CP and license)
206	40 dBu contour of co-channel WWCJ (License only) 40 dBu contour of co-channel WWFM 54 dBu contour of 1 <sup>st</sup> adjacent WBZC (CP and license)
207	40 dBu contour of co-channel WNJB (CP and license) 54 dBu contour of 1 <sup>st</sup> adjacent WSJI

208	40 dBu contour of co-channel WSJI
209	40 dBu contours of co-channel WGLS & WRDR 54 dBu contour of 1 <sup>st</sup> adjacent WSJI
210	54 dBu contour of 1 <sup>st</sup> adjacent WRTI
211	40 dBu contour of co-channel WRTI
212	54 dBu contour of 1 <sup>st</sup> adjacent WRTI
213	Available
214	54 dBu contour of 1 <sup>st</sup> adjacent WHYY-FM
215	40 dBu contour of co-channel WHYY-FM
216	40 dBu contour of co-channel WWNJ 54 dBu contour of 1 <sup>st</sup> adjacent WHYY-FM
217	40 dBu contour of co-channel WRTQ
218	<p>This frequency could be used approximately 16 km to the ESE of Medford Lakes, but the tiny Area to Locate has all of the same restrictions as the Area to Locate for channel 213. All of the same arguments pertaining to the New Jersey Pinelands apply to this area as well.</p> <p>Furthermore, if a station could be built in this Area to Locate, it would be limited by the 40 dBu contour of co-channel WNYE, the 54 dBu contour of 1<sup>st</sup> adjacent WRTQ and the 60 dBu contour of 3<sup>rd</sup> adjacent WHYY-FM. The maximum output power would be insufficient for the 60 dBu contour to reach the city of license.</p>
219	40 dBu contour of co-channel WKDU
220	40 dBu of 3 of the 4 mutually exclusive stations filed in Barnegat, NJ. Short-spaced to commercial stations WVLT & WXTU.

### **Conclusion**

As can be seen from this table, channel 213 is the only channel that is available to provide service to our city of license, Medford Lakes, New Jersey.

## Alternate Showing to Demonstrate Compliance with 47 CFR §73.509

Having attempted to locate another site on which to construct a tower, a pre-existing tower or another non-commercial channel, all without success, the applicant next began to consider any novel and/or unique approaches. This was only attempted when all other possible solutions were examined and ruled out.

The applicant began by searching for existing towers that were only slightly outside the Area to Locate. A primary consideration was to stay sufficiently close to the city of license such that the desired service could still be provided. This search led to the consideration of the tower owned and operated by WNJS-TV, New Jersey Public Broadcasting. This tower is unusually tall and is close enough to the city of license to allow adequate coverage, and is only slightly outside of the Area to Locate.

The applicant thus proposes and respectfully requests to use this unusually tall tower to support an Alternate Showing to Demonstate Compliance with 47 CFR §73.509 and, to the extent necessary, respectfully requests a waiver from 47 CFR §73.509.

With regard to contour overlap with WHYY-FM and WRTI, the applicant will demonstrate that in fact there will be no contour overlap even though the proposed transmitter site is located within the licensed 60 dBu contour of these two stations. By using this existing unusually tall tower and employing a multiple bay antenna system, there is no overlap of the proposed 100 dBu contour to the 60 dBu contours as determined using figures 1 and 1a of CFR 47 §73.333.

Attached to this study is the elevation pattern of the proposed antenna (Figures 9 & 10) and two plots of the 100 dBu contour depicted in the vertical plane (Figures 12 & 13). These plots indicate the ground level as well as an indication of elevation 9 meters above ground level. From these two plots it can be clearly seen that there is no overlap at the 9 meter elevation.

The applicant wishes to note that this is not a U/D study. Neither do we argue that the affected area is currently uninhabited, which it is. Our argument is that the area is in fact *uninhabitable*.

The applicant believes that the particularity of the facts and circumstances in this case warrant such a waiver, and will demonstrate in this section that such a waiver will cause absolutely no harmful interference to anyone. Additionally, the applicant's situation with respect to the Pinelands National Reserve is singularly unique, and a waiver in this extraordinary situation will not serve to undermine existing protections afforded by FCC rules.

### **Transmitter Site is Within the 60 dBu Protected Contour of WHYY-FM & WRTI, both 2<sup>nd</sup> Adjacent Stations**

Using conventional contour protection as specified in 47 CFR §73.509, this application fully protects all authorized and previously cutoff proposals operating co-channel, first, second and third adjacent with the exception of WHYY-FM and WRTI, both in Philadelphia. Attached as Figures 6-8 are allocation study maps showing compliance pursuant to 47 CFR §73.509.

The applicant has been unable to find anything in the Commission's rules that forbids the location of their transmitter within the 60 dBu contour of a second adjacent station. The only requirements concern contour overlap, and the applicant will show that this will not occur.

### **Protected Contours Are To Be Measured at a Height of 9 Meters**

The Commission prescribes in 47 CFR §73.509(a), that the 100 dBu and 60 dBu contours of second adjacent stations

"will not be accepted if the proposed operation would involve overlap of signal strength contours with any other station licensed by the Commission and operating in the reserved band."

In determining the distance to the proposed 100 dBu contour, Figures 1 and 1a of 47 CFR §73.333 were used. For distances less than 1.5 kilometers, and therefore not covered by the curves, the free space formula was used. Where the distance was less than 1.5 kilometers on the curves but greater than 1.5 kilometers using the free space formula, the distance used was 1.5 kilometers.

These curves are based upon estimated field strengths exceeded at 50 percent of the potential receiver locations for at least 50 (or 10) percent of the time, and are based on the stated height of the transmitting antenna with an assumed receiving antenna height of 9 meters.

### **The Use of Vertical Elevation Patterns Is Specifically Required**

With regard to the use of vertical elevation patterns, the Commission states in 47 CFR §73.313(c)(2)

“... When predicting field strengths over areas not in the plane of the maximum main lobe, use the ERP in the direction of such areas, determined by considering the appropriate vertical radiation pattern.”

When employing a multiple bay fractional-wave spaced antenna, the maximum main lobe is toward the horizon and the downward power is substantially reduced. For measurement at locations close to the transmitting antenna, the use of the vertical radiation pattern produces the only accurate assessment of field strength.

### **Interfering Contour Does Not Reach Down to a Height of 9 Meters**

The applicant's study shows that at a height of 9 meters above ground in this sparsely populated area our signal strength never exceeds 99 dBu. In fact, there is such a large margin of error that our 100 dBu interfering contour is always AT LEAST 30 meters above ground at every point. There is no location where the 100 dBu contour comes closer to the ground than 30 meters. This is documented in the attached spreadsheet, Figure 11, which shows the signal strength at 9 meters of elevation as well as the corresponding elevation of the 100 dBu contour. The same is also depicted graphically in Figures 12 & 13.

By using a four bay 0.94-wave spaced antenna located 238 meters above ground level the entire 100 dBu contour falls entirely in the sky, above ground, and in all cases misses the ground by a minimum of 30 meters. This is well above the 9 meter height specified for the computation of the 60 dBu contour in 47 CFR §73.333.

### **Alternate Showing of Compliance with 47 CFR §73.509**

The applicant has shown that its 100 dBu contour does NOT overlap the 60 dBu contour of the 2<sup>nd</sup> adjacent stations. The applicant's 100 dBu contour does not reach the 9 meter height specified for the computation of the 60 dBu contour in 47 CFR §73.333. This is the standard means of contour protection with the exception that it has been done using a three dimensional method.

### **No Interference Will Be Caused**

As the applicant has demonstrated, there will be no interference because the applicant's 100 dBu contour will not reach the point specified in 47 CFR §73.333 for the measurement of the 60 dBu contour of the 2<sup>nd</sup> adjacent station.

### **This Area is not Merely Uninhabited It is *Uninhabitable***

It is noted that under 47 CFR §73.509(e), this section would not apply if this area were to lie entirely over water. We argue that this section reasonably assumes that such an area would be *uninhabitable*. This proposal would have the exact same result except that the 100 dBu area lies entirely in the sky, an area that is similarly uninhabitable by any definition of the word. Just as you would not expect to find a house in the middle of the Chesapeake Bay, neither will you find one hundreds of feet in the air in the middle of the New Jersey Pinelands. Indeed, the proposed 100 dBu contour misses the ground by more than 30 meters at all points.

### **No Structures Will Ever Extend into This Area**

The tower itself, while not in the Area to Locate, is still within the Pinelands National Reserve. Existing construction (with the exception of the tower itself, which was allowed as an existing structure at the inception of the Pinelands National Reserve) does not rise to 30 meters, and new construction of any type (i.e., towers, buildings, homes, etc.) is limited to a height of 35 **feet** (N.J.A.C. 7:50-5.4(a)). Not only are there no structures that are even close to this height, but no structures will ever be permitted in the New Jersey Pinelands that exceed a height of 35 **feet** (11 meters).

### **This is NOT a U/D Study**

A U/D study compares the undesired-to-desired signal strengths, and is based on a ratio of 40 dBu. Had this been a U/D study, the applicant would have computed the signal strength of the 2<sup>nd</sup> adjacent stations and shown that its signal strength did not exceed the signal strength of the 2<sup>nd</sup> adjacent stations by more than 40 dBu. Alternatively, the applicant would have shown that any areas where this overlap occurred were uninhabited.

What the applicant has done instead is to show that its 100 dBu contour does NOT overlap the 60 dBu contour of the 2<sup>nd</sup> adjacent stations. The applicant's 100 dBu contour does not reach the 9 meter height specified for the computation of the 60 dBu contour in 47 CFR §73.333. This is the standard means of contour protection with the exception that it has been done using a three dimensional method. We can find no section in the rules that forbids the use of this approach.

This is also better than the U/D method for another reason - the applicant is working with its 100 dBu contour and has made no effort to evaluate the higher signal strength contour possible with a U/D study. Had the applicant done this, it would have made the proof easier and in the applicant's favor. By continuing to use the 100 dBu contour we are seeking to show that this proof is not a U/D study, provides better protection than a U/D study and represents a higher level of accountability than a U/D study.

With regard to a traditional U/D study, the Commission has stated, "we have no objection to the use of the ratio method in support of a request for waiver as a means of presenting what practical effects this violation would have on the listening public...", *Carl Sandberg High School* (BPED-19970130MA, Orland Park, IL), Audio Services Div. letter, October 30, 1997. Here, the permittee has shown that this application meets all Commission criteria when the overlap issue is examined using valid a three-dimensional methodology--methodology shown below to be employed in the context of interference analyses conducted under other rules. However, should the Commission choose to view the overlap only in a two-dimensional context, then the applicant requests that the three-dimensional data be used, alternatively, to show the "practical effects this violation would have on the listening public". As the applicant's showings clearly demonstrate, there are **no** practical effects, **no** interference and **no** overlap. There simply is **no** loss of **any** kind to **anyone**.

### **Similar Showings Permitted With Regard to TV Channel 6 Protection**

The applicant is not aware of any instance where this three dimensional type of study has been used to demonstrate compliance with 47 CFR §73.509. The applicant is aware, however, that the Commission has, and does, permit such a showing with regard to TV Channel 6 protection under 47 CFR §73.525. Station WNJT-FM was authorized having used such methodology with regard to 47 CFR §73.525.

## **No Disruption to Allocation Scheme**

The Commission has previously stated that:

Section 73.509 is not only intended to prevent interference; it is a Commission vehicle for ensuring a fair distribution of non-commercial educational FM service throughout the country, as mandated by Section 307(b) of the Communications Act.

*See American Educational Broadcasting* (BPED-19960118MM, Pollock Pines, CA), Audio Div. letter, October 21, 1996. This proposal does not disrupt the allocation scheme in any way, because, unlike the situation in *American Educational Broadcasting*, WVBV is already authorized. Thus, the relocation of its transmitting site to an area where its construction is allowed under Federal and state law will not compromise the allocation system. The permittee is not proposing to “shoe-horn” in a new station that does not fit under Section 73.509 of the rules. On the contrary, the Commission already has made, consistent with the allocation scheme referenced in *American Educational Broadcasting*, an affirmative determination under Section 307(b) of the Act that there is a public need for a new non-commercial educational station at Medford Lakes. And, as shown in this exhibit, a change in location is essential to effectuate that public interest finding. Also relevant to the allocation issue are the facts that Medford Lakes is a considerable distance from the nearest metropolitan area (Philadelphia) and represents an entirely different population and lifestyle that is not served by distant larger stations. The public interest values embodied in the allocations scheme clearly favor an accommodation rather than a rejection here.

## **The Commission’s Position**

The applicant is aware and has taken note of the Commission’s views on the related matter of received interference:

...when faced with a choice between increased coverage with increased interference received on one hand, and lesser but adequate coverage without prohibited interference on the other, the Commission favors the latter.

*Educational Information Corporation*, 6 FCC Rcd 2207, 2208 (1991). It is further understood that the quoted language pertains to *received* overlap and not *caused* overlap, but there are a number of similarities. This application proposes to cause overlap only if the traditional methods are used to evaluate the potential for interference; but by using the alternative three-dimensional method discussed above, there is absolutely no overlap between the proposed 100 dBu contour and the 60 dBu contours of WHYY-FM and WRTI.

### Coverage vs. No Coverage

The applicant would further like to point out that the Commission's wording in the above quote refers to "lesser but adequate" coverage. The Commission has also indicated that increased service alone is not a sufficient reason for a waiver of 47 CFR §73.509.

With regards to this application, it has become a matter of "coverage" or "no coverage". This application does not propose increased coverage for the sake of increased coverage alone. The applicant is not attempting to squeeze out a few more people or a few more square kilometers of coverage. This application is being presented as a means of **survival**.

Without this waiver, the applicant will not have lesser coverage but rather will have **no coverage** (and no station). The applicant enjoys **no** choices and **no** options, due to Federal and New Jersey State laws governing the Pinelands National Reserve.

### Further Section 307(b) Considerations

As noted above, a grant of this waiver would further the goal of Section 307(b) of the Act to provide new, local service to the unserved residents of Medford Lakes, New Jersey. On the other hand, if the applicant is unable to construct this station, the residents of Medford Lakes, New Jersey will lose their only local station forever contrary to the Commission's Section 307(b) mandate.

Moreover, this application proposes a 1<sup>st</sup> noncommercial educational service to 4,120 people and 2<sup>nd</sup> such service to 7,953 people, for a total of 12,073 receiving new 1<sup>st</sup> or 2<sup>nd</sup> NCE service. These numbers were calculated by plotting on a map (Figure 14) all noncommercial educational stations in the area with their 60 dBu coverage areas. The enclosed population centroids are shown in red for those people receiving 1<sup>st</sup> NCE service and green for those people receiving 2<sup>nd</sup> NCE service. All calculations are based on the 2000 census.

## Summary and Conclusion

The applicant has shown that the affected, 2<sup>nd</sup> adjacent stations will not lose any coverage or suffer harm in any way. Because of the singularly unique situation faced by the applicant, an authorized station which is legally precluded from operating at a site meeting the traditional requirements of Section 73.509 of the rules, there will be little if any precedent created by approval of the requested waiver.

Technically, the waiver analysis presented above has validity for two primary reasons. The first is the advantage of the height available by the use of an unusually tall (for this area) television broadcast tower. The second is the use of the antenna elevation (vertical plane) pattern, which has been kept very narrow by employing a four bay 0.94-wave spaced antenna.

Using this methodology, the applicant has clearly shown:

- 1) The details regarding the loss of original site;
- 2) That there are no other transmitter sites available;
- 3) That there are no other towers available;
- 3) That there are no other channels available; and
- 4) Compliance with 47 CFR §73.509 by alternate means.

With regards to the alternate showing, the applicant has shown:

- 1) 47 CFR §73.333 specifies that contours are to be measured at a height of 9 meters;
- 2) The applicant's 100 dBu contour does not extend down to a height of 9 meters at any point;
- 3) Therefore, there is no overlap of contours;
- 4) No interference will be caused;
- 5) Any contour overlap occurs in an *uninhabitable* place;
- 6) There are no structures that extend into this space;
- 7) There can never be any structures that extend into this space;
- 8) This is not a U/D study;
- 9) There is no disruption to the allocation scheme;
- 10) Even using the traditional, two-dimensional approach, any overlap that exists is *de minimis*;
- 11) This is the only possible way for the applicant to construct their station;
- 12) A situation of coverage vs. no coverage and station vs. no station;
- 13) There will be no harm to the 2<sup>nd</sup> adjacent stations;
- 14) A singularly unique situation; and
- 15) There is no far reaching impact to the Commission's rules.

Request for Waiver of CFR 47 §73.509  
to the extent necessary to permit  
an alternate showing of compliance

To the extent that a waiver of CFR 47 §73.509 is required to permit this alternate showing of compliance, the same is hereby respectfully requested.

While making this request the applicant is aware that a condition may, and in fact should, be placed upon the authorization indicating that future modifications of this facility must specify lack of contour overlap to all stations.

The applicant has made a clear showing that they are following the proper rules, serving the proper area and providing the proper coverage.

Given the singularly unique circumstances facing this applicant with regard to transmitter site location, having been discussed in detail above, and given the attached showing demonstrating compliance with CFR 47 §73.509, the applicant believes that this proposal represents it's only viable option to provide service to Medford Lakes, New Jersey while complying with the Commission's Rules and regulations.

## No Rotation Required

180											
AZ	FIELD	AZ	FIELD	AZ	FIELD	AZ	FIELD	AZ	FIELD	AZ	FIELD
0	0.793	10	0.999	20	0.877	30	0.699	40	0.588	50	0.602
60	0.715	70	0.699	80	0.555	90	0.441	100	0.350	110	0.278
120	0.221	130	0.178	140	0.178	150	0.200	160	0.206	170	0.257
180	0.320	190	0.402	200	0.507	210	0.565	220	0.448	230	0.378
240	0.354	250	0.376	260	0.390	270	0.448	280	0.565	290	0.711
300	0.895	310	1.000	320	1.000	330	1.000	340	1.000	350	0.999

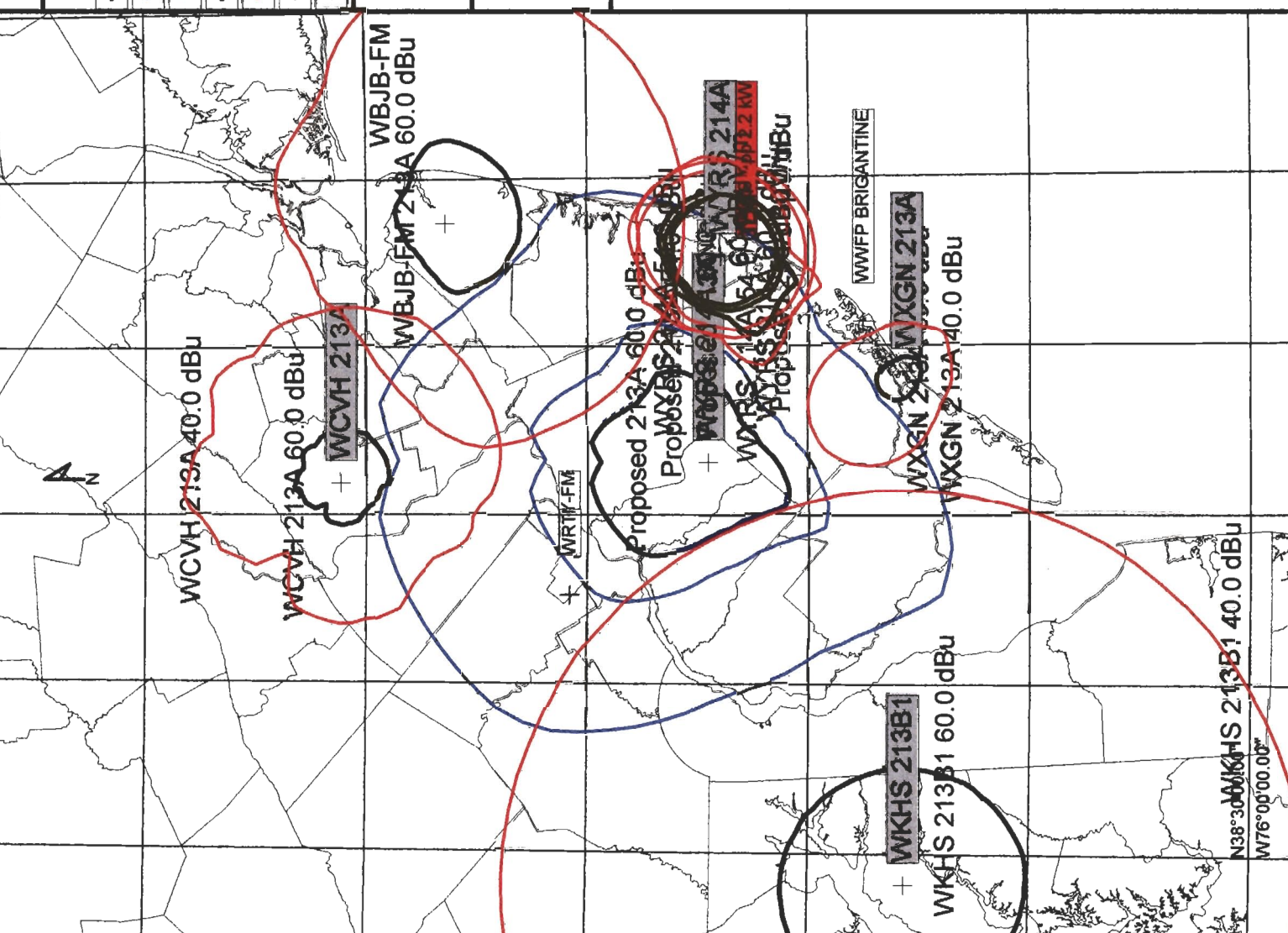
# Directional Field

Medford Lakes, NJ

No Rotation Required

Figure 5

<u>Azimuth</u>	<u>Relative Field</u>	<u>ERP(kW)</u>	<u>dBk</u>	<u>d dB</u>
0	0.7934	0.776	-1.1000	2.000
10	0.9989	1.230	0.9000	-1.129
20	0.8772	0.949	-0.2288	-1.974
30	0.6988	0.602	-2.2028	-1.499
40	0.5881	0.426	-3.7017	0.197
50	0.6016	0.446	-3.5045	1.501
60	0.7151	0.630	-2.0036	-0.199
70	0.6989	0.602	-2.2022	-2.000
80	0.5552	0.380	-4.2022	-2.000
90	0.4410	0.240	-6.2022	-2.000
100	0.3503	0.151	-8.2022	-2.000
110	0.2782	0.095	-10.2022	-2.000
120	0.2210	0.060	-12.2022	-1.887
130	0.1778	0.039	-14.0893	0.000
140	0.1778	0.039	-14.0893	1.032
150	0.2003	0.049	-13.0574	0.254
160	0.2062	0.052	-12.8033	1.900
170	0.2567	0.081	-10.9031	1.908
180	0.3197	0.126	-8.9954	2.000
190	0.4025	0.200	-6.9954	2.000
200	0.5067	0.317	-4.9954	0.940
210	0.5646	0.393	-4.0554	-2.000
220	0.4485	0.248	-6.0554	-1.480
230	0.3782	0.176	-7.5350	-0.577
240	0.3539	0.154	-8.1121	0.536
250	0.3764	0.175	-7.5765	0.306
260	0.3899	0.187	-7.2702	1.215
270	0.4485	0.248	-6.0554	2.000
280	0.5646	0.393	-4.0554	1.997
290	0.7106	0.623	-2.0585	2.000
300	0.8945	0.987	-0.0585	0.968
310	1.0000	1.233	0.9096	0.000
320	1.0000	1.233	0.9096	0.000
330	1.0000	1.233	0.9096	0.000
340	1.0000	1.233	0.9096	-0.010
350	0.9989	1.230	0.9000	-2.000
45	0.5948	0.436	-3.6031	
135	0.1778	0.039	-14.0893	
225	0.4119	0.209	-6.7952	
315	1.0000	1.233	0.9096	
	<u>RMS</u>	<u>Max ERP</u>	<u>Delta</u>	<u>Max Step</u>
	0.6232	1.233	14.999	2.0000



### Figure 6

## Medford Lakes, NJ Co-Channel & 1st Adjacents

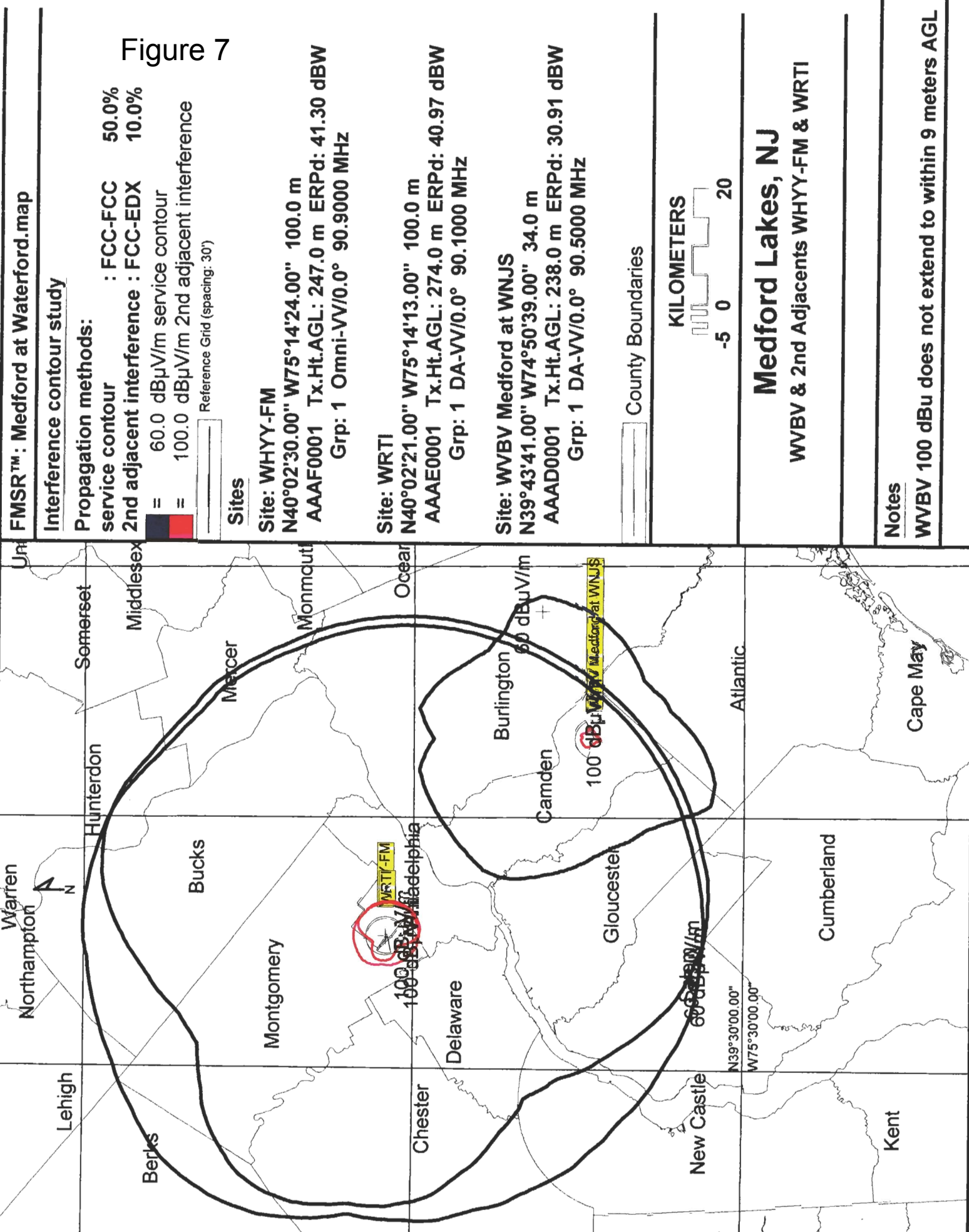


Figure 7

Interference contour study

Propagation methods:

service contour : FCC-FCC 50.0%  
cochannel interference : FCC-FCC 10.0%

± 60.0 dBμV/m service contour  
± 40.0 dBμV/m cochannel interference

Reference Grid (spacing: 30')

Sites

Site: WVBV Medford at WNJS

N39°43'41.00" W74°50'39.00" 34.0 m

AAAD0001 Tx.Ht.AGL: 238.0 m ERPd: 30.91 dBW

Grp: 1 DA-VV/0.0° 90.5000 MHz

Site: WWFP BRIGANTINE

N39°22'46.00" W74°25'45.00" 1.0 m

AAAC0001 Tx.Ht.AGL: 94.0 m ERPd: 18.87 dBW

Grp: 1 DA-VV/0.0° 90.5000 MHz

County Boundaries

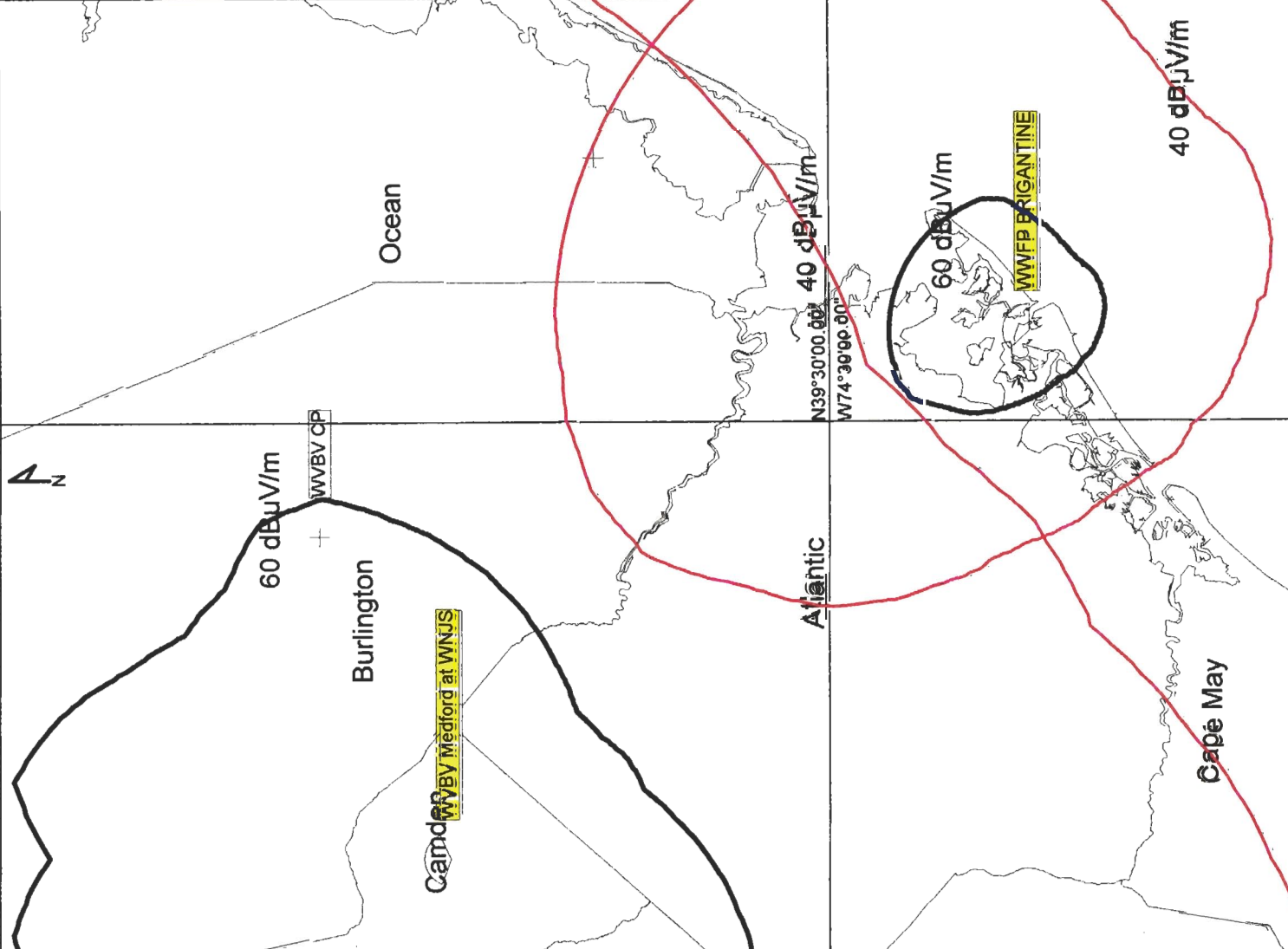
KILOMETERS



Medford Lakes, NJ

WVBV & WWFP

Figure 8



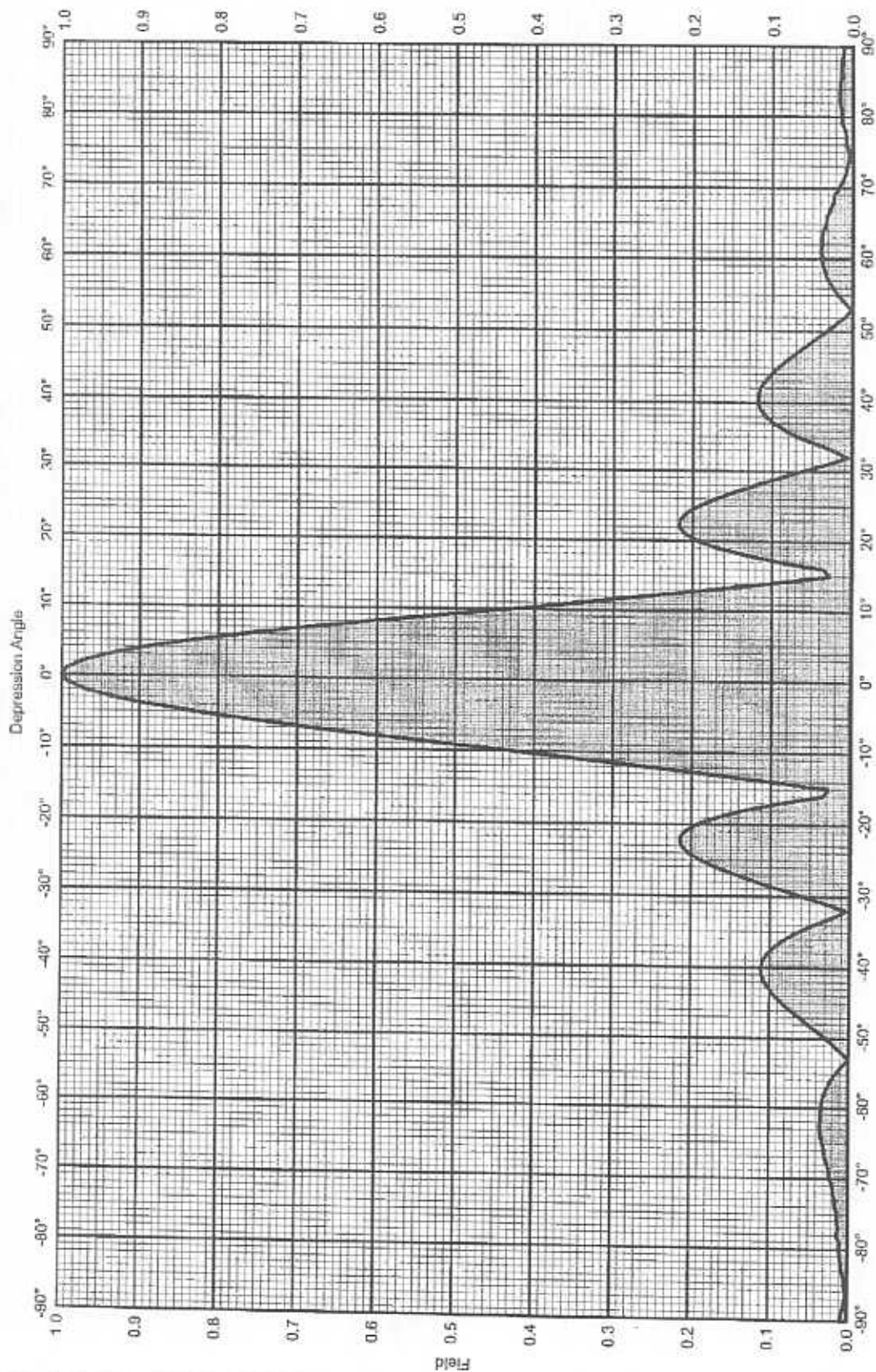


Figure 9

Power-x: 15.85  
Vertical Polarization  
Vertical Plane Pattern

4xYA7-FMH/URM/VV FM Yagi Array  
Four antennas skewed 0 degrees  
Vertically stacked @ .94 wl  
Max Gain: 12 dBd

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Figure 10

4xYA7-PMH/URM/VV FM Yagi Array  
Four antennas skewed 0 degrees  
Vertically stacked @ .94 w1  
Max Gain: 12 dBd

Power-x: 15.85  
Vertical Polarization  
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	0.084	-21.52	-9.52	0.11
-89	0.010	-40.00	-28.00	0.00	-44	0.093	-20.61	-8.61	0.14
-88	0.010	-40.00	-28.00	0.00	-43	0.101	-19.95	-7.95	0.16
-87	0.010	-40.00	-28.00	0.00	-42	0.107	-19.44	-7.44	0.18
-86	0.010	-40.00	-28.00	0.00	-41	0.110	-19.16	-7.16	0.19
-85	0.010	-40.00	-28.00	0.00	-40	0.110	-19.14	-7.14	0.19
-84	0.010	-40.00	-28.00	0.00	-39	0.108	-19.33	-7.33	0.18
-83	0.010	-40.00	-28.00	0.00	-38	0.102	-19.80	-7.80	0.17
-82	0.010	-40.00	-28.00	0.00	-37	0.093	-20.62	-8.62	0.14
-81	0.010	-40.00	-28.00	0.00	-36	0.081	-21.88	-9.88	0.10
-80	0.011	-39.49	-27.49	0.00	-35	0.064	-23.83	-11.83	0.07
-79	0.010	-40.00	-28.00	0.00	-34	0.045	-27.03	-15.03	0.03
-78	0.013	-37.80	-25.80	0.00	-33	0.022	-33.23	-21.23	0.01
-77	0.011	-39.16	-27.16	0.00	-32	0.010	-40.00	-28.00	0.00
-76	0.012	-38.13	-26.13	0.00	-31	0.031	-30.20	-18.20	0.02
-75	0.012	-38.44	-26.44	0.00	-30	0.060	-24.48	-12.48	0.06
-74	0.016	-35.92	-23.92	0.00	-29	0.089	-21.02	-9.02	0.13
-73	0.015	-36.24	-24.24	0.00	-28	0.117	-18.63	-6.63	0.22
-72	0.018	-34.93	-22.93	0.01	-27	0.144	-16.81	-4.81	0.33
-71	0.019	-34.22	-22.22	0.01	-26	0.168	-15.48	-3.48	0.45
-70	0.022	-33.14	-21.14	0.01	-25	0.189	-14.49	-2.49	0.56
-69	0.024	-32.43	-20.43	0.01	-24	0.204	-13.83	-1.83	0.66
-68	0.026	-31.83	-19.83	0.01	-23	0.212	-13.47	-1.47	0.71
-67	0.029	-30.82	-18.82	0.01	-22	0.214	-13.39	-1.39	0.73
-66	0.031	-30.30	-18.30	0.01	-21	0.207	-13.67	-1.67	0.68
-65	0.032	-29.94	-17.94	0.02	-20	0.192	-14.35	-2.35	0.58
-64	0.034	-29.35	-17.35	0.02	-19	0.167	-15.55	-3.55	0.44
-63	0.035	-29.00	-17.00	0.02	-18	0.132	-17.56	-5.56	0.28
-62	0.035	-29.12	-17.12	0.02	-17	0.088	-21.08	-9.08	0.12
-61	0.035	-29.20	-17.20	0.02	-16	0.035	-29.16	-17.16	0.02
-60	0.034	-29.32	-17.32	0.02	-15	0.027	-31.23	-19.23	0.01
-59	0.032	-29.78	-17.78	0.02	-14	0.098	-20.21	-8.21	0.15
-58	0.030	-30.36	-18.36	0.01	-13	0.174	-15.17	-3.17	0.48
-57	0.026	-31.64	-19.64	0.01	-12	0.257	-11.80	0.20	1.05
-56	0.021	-33.39	-21.39	0.01	-11	0.343	-9.29	2.71	1.87
-55	0.016	-36.14	-24.14	0.00	-10	0.431	-7.31	4.69	2.94
-54	0.010	-40.00	-28.00	0.00	-9	0.519	-5.69	6.31	4.27
-53	0.010	-40.00	-28.00	0.00	-8	0.605	-4.37	7.63	5.80
-52	0.010	-40.00	-28.00	0.00	-7	0.688	-3.25	8.75	7.50
-51	0.018	-34.77	-22.77	0.01	-6	0.763	-2.35	9.65	9.23
-50	0.029	-30.87	-18.87	0.01	-5	0.831	-1.61	10.39	10.95
-49	0.040	-28.04	-16.04	0.02	-4	0.890	-1.02	10.98	12.54
-48	0.051	-25.77	-13.77	0.04	-3	0.937	-0.57	11.43	13.91
-47	0.062	-24.18	-12.18	0.06	-2	0.971	-0.25	11.75	14.96
-46	0.074	-22.65	-10.65	0.09	-1	0.993	-0.06	11.94	15.63
					0	1.000	-0.00	12.00	15.85

# Hope Christian Church of Marlton, Inc. - Figure 11

*Freespace Interference Study based on Vertical Radiation Pattern  
Scala Vertically Polarized 4-bay 0.94-wave spaced antenna*

Depression Angle from Antenna	Antenna Relative Field	ERP Watts	ERP dBk	Distance to Ground from Antenna (m)	Free Space Signal (dBu)	Circular Distance From Tower (m)	Distance to Contour using Free Space (m)	Height of Contour above Ground (m)
90	0.010	0.123	-39.09	238.00	80.30	0.00	24.63	213.37
89	0.010	0.123	-39.09	238.04	80.30	4.15	24.63	213.37
88	0.010	0.123	-39.09	238.15	80.29	8.31	24.63	213.38
87	0.010	0.123	-39.09	238.33	80.29	12.47	24.63	213.40
86	0.010	0.123	-39.09	238.58	80.28	16.64	24.63	213.43
85	0.010	0.123	-39.09	238.91	80.26	20.82	24.63	213.46
84	0.010	0.123	-39.09	239.31	80.25	25.01	24.63	213.50
83	0.010	0.123	-39.09	239.79	80.23	29.22	24.63	213.55
82	0.010	0.123	-39.09	240.34	80.21	33.45	24.63	213.61
81	0.010	0.123	-39.09	240.97	80.19	37.70	24.63	213.67
80	0.011	0.149	-38.26	241.67	80.99	41.97	27.09	211.32
79	0.010	0.123	-39.09	242.45	80.14	46.26	24.63	213.82
78	0.013	0.208	-36.81	243.32	82.39	50.59	32.02	206.68
77	0.011	0.149	-38.26	244.26	80.90	54.95	27.09	211.60
76	0.012	0.178	-37.51	245.29	81.62	59.34	29.56	209.32
75	0.012	0.178	-37.51	246.40	81.58	63.77	29.56	209.45
74	0.016	0.316	-35.01	247.59	84.04	68.25	39.41	200.12
73	0.015	0.277	-35.57	248.87	83.43	72.76	36.95	202.67
72	0.018	0.399	-33.98	250.25	84.97	77.33	44.34	195.83
71	0.019	0.445	-33.52	251.71	85.39	81.95	46.80	193.75
70	0.022	0.597	-32.24	253.27	86.61	86.62	54.19	187.08
69	0.024	0.710	-31.49	254.93	87.31	91.36	59.11	182.81
68	0.026	0.834	-30.79	256.69	87.94	96.16	64.04	178.62
67	0.029	1.037	-29.84	258.55	88.83	101.03	71.43	172.25
66	0.031	1.185	-29.26	260.52	89.34	105.96	76.36	168.25
65	0.032	1.263	-28.99	262.60	89.55	110.98	78.82	166.57
64	0.034	1.425	-28.46	264.80	90.00	116.08	83.75	162.73
63	0.035	1.510	-28.21	267.11	90.18	121.27	86.21	161.19
62	0.035	1.510	-28.21	269.55	90.10	126.55	86.21	161.88
61	0.035	1.510	-28.21	272.12	90.02	131.93	86.21	162.60
60	0.034	1.425	-28.46	274.82	89.68	137.41	83.75	165.47
59	0.032	1.263	-28.99	277.66	89.06	143.00	78.82	170.44
58	0.030	1.110	-29.55	280.64	88.41	148.72	73.89	175.34
57	0.026	0.834	-30.79	283.78	87.07	154.56	64.04	184.29
56	0.021	0.544	-32.65	287.08	85.11	160.53	51.73	195.12
55	0.016	0.316	-35.01	290.54	82.65	166.65	39.41	205.72
54	0.010	0.123	-39.09	294.18	78.46	172.92	24.63	218.07
53	0.010	0.123	-39.09	298.01	78.35	179.35	24.63	218.33
52	0.010	0.123	-39.09	302.03	78.23	185.95	24.63	218.59
51	0.018	0.399	-33.98	306.25	83.21	192.73	44.34	203.54
50	0.029	1.037	-29.84	310.69	87.23	199.71	71.43	183.28
49	0.040	1.973	-27.05	315.35	89.89	206.89	98.52	163.64
48	0.051	3.207	-24.94	320.26	91.87	214.30	125.62	144.65
47	0.062	4.740	-23.24	325.42	93.43	221.94	152.71	126.31
46	0.074	6.752	-21.71	330.86	94.82	229.83	182.27	106.89
45	0.084	8.700	-20.60	336.58	95.77	238.00	206.90	91.70

44	0.093	10.664	-19.72	342.61	96.50	246.46	229.07	78.88
43	0.101	12.578	-19.00	348.97	97.06	255.22	248.77	68.34
42	0.107	14.117	-18.50	355.69	97.40	264.33	263.55	61.65
41	0.110	14.919	-18.26	362.77	97.46	273.79	270.94	60.25
40	0.110	14.919	-18.26	370.26	97.29	283.64	270.94	63.84
39	0.108	14.382	-18.42	378.19	96.94	293.91	266.01	70.59
38	0.102	12.828	-18.92	386.58	96.26	304.63	251.24	83.32
37	0.093	10.664	-19.72	395.47	95.26	315.84	229.07	100.14
36	0.081	8.090	-20.92	404.91	93.85	327.58	199.51	120.73
35	0.064	5.050	-22.97	414.94	91.59	339.90	157.64	147.58
34	0.045	2.497	-26.03	425.61	88.31	352.85	110.84	176.02
33	0.022	0.597	-32.24	436.99	81.87	366.49	54.19	208.49
32	0.010	0.123	-39.09	449.13	74.78	380.88	24.63	224.95
31	0.031	1.185	-29.26	462.10	84.36	396.10	76.36	198.67
30	0.060	4.439	-23.53	476.00	89.84	412.23	147.79	164.11
29	0.089	9.767	-20.10	490.91	93.00	429.36	219.22	131.72
28	0.117	16.879	-17.73	506.95	95.09	447.61	288.18	102.71
27	0.144	25.567	-15.92	524.24	96.61	467.10	354.69	76.98
26	0.168	34.800	-14.58	542.92	97.64	487.97	413.80	56.60
25	0.189	44.044	-13.56	563.16	98.35	510.39	465.53	41.26
24	0.204	51.313	-12.90	585.15	98.68	534.56	502.47	33.63
23	0.212	55.416	-12.56	609.11	98.66	560.69	522.18	33.97
22	0.214	56.466	-12.48	635.33	98.38	589.07	527.10	40.54
21	0.207	52.833	-12.77	664.12	97.70	620.01	509.86	55.28
20	0.192	45.453	-13.42	695.87	96.65	653.90	472.91	76.25
19	0.167	34.387	-14.64	731.03	95.01	691.20	411.34	104.08
18	0.132	21.484	-16.68	770.18	92.51	732.49	325.13	137.53
17	0.088	9.548	-20.20	814.03	88.51	778.46	216.75	174.63
16	0.035	1.510	-28.21	863.45	79.99	830.00	86.21	214.24
15	0.027	0.899	-30.46	919.56	77.19	888.23	66.50	220.79
14	0.098	11.842	-19.27	983.79	87.80	954.57	241.38	179.60
13	0.174	37.330	-14.28	1058.01	92.15	1030.89	428.58	141.59
12	0.257	81.438	-10.89	1144.72	94.85	1119.70	633.02	106.39
11	0.343	145.061	-8.38	1247.32	96.62	1224.40	844.84	76.80
10	0.431	229.043	-6.40	1370.59	97.78	1349.77	1061.59	53.66
9	0.519	332.122	-4.79	1521.40	98.49	1502.67	1278.35	38.02
8	0.605	451.309	-3.46	1710.10	98.80	1693.46	1490.17	30.61
7	0.688	583.633	-2.34	1952.91	98.77	1938.35	1694.61	31.48
6	0.763	717.814	-1.44	2276.89	98.33	2264.42	1879.34	41.56
5	0.831	851.462	-0.70	2730.74	97.50	2720.35	2046.83	59.61
4	0.890	976.659	-0.10	3411.87	96.16	3403.56	2192.16	85.08
3	0.937	1082.536	0.34	4547.54	94.11	4541.31	2307.92	117.21
2	0.971	1162.523	0.65	6819.58	90.90	6815.43	2391.67	154.53
1	0.993	1215.798	0.85	13637.09	85.07	13635.01	2445.86	195.31
0.1	1.000	1233.000	0.91	136364.02	65.14	136363.82	2463.10	233.70

Distance to Ground Level assumes flat ground or a site where the site level is above average terrain in all azimuths.

Maximum ERP	1233 watts	Max dBu at	98.80	Lowest Height	30.61
Radiation Center AG	238.00 m	Ground Level		of Interfering Contour	
Radiation Center AG	780.84 ft.				
Maximum ERP	0.91 dBk				
Protected dBu	60.00 dBu				
Interfering dBu	100.00 dBu				
Free Space Distance	2463.10 m				

Figure 12

100 dBu Contour, Scala 4-Bay Vertical YAGI, 1.233 kW

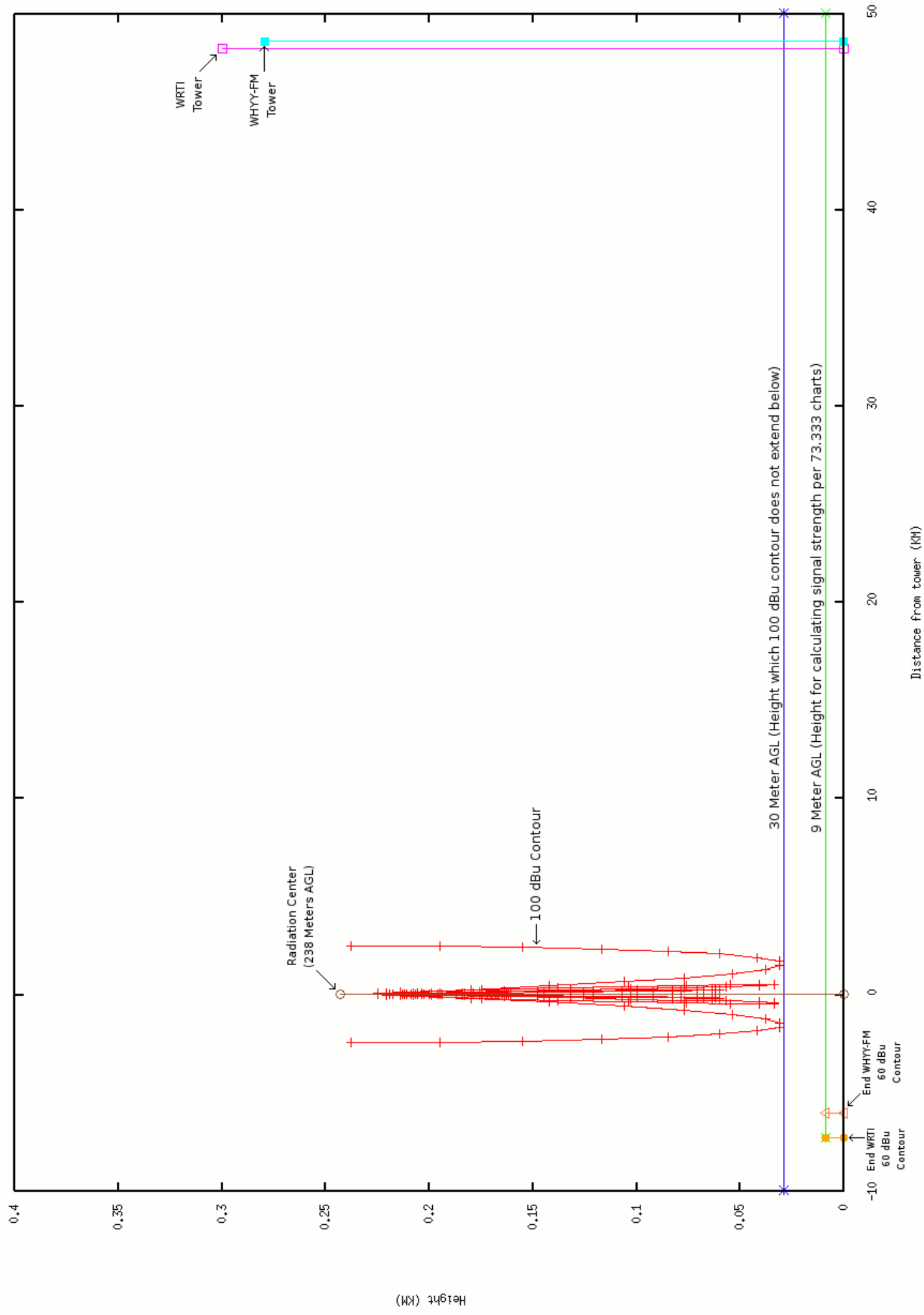
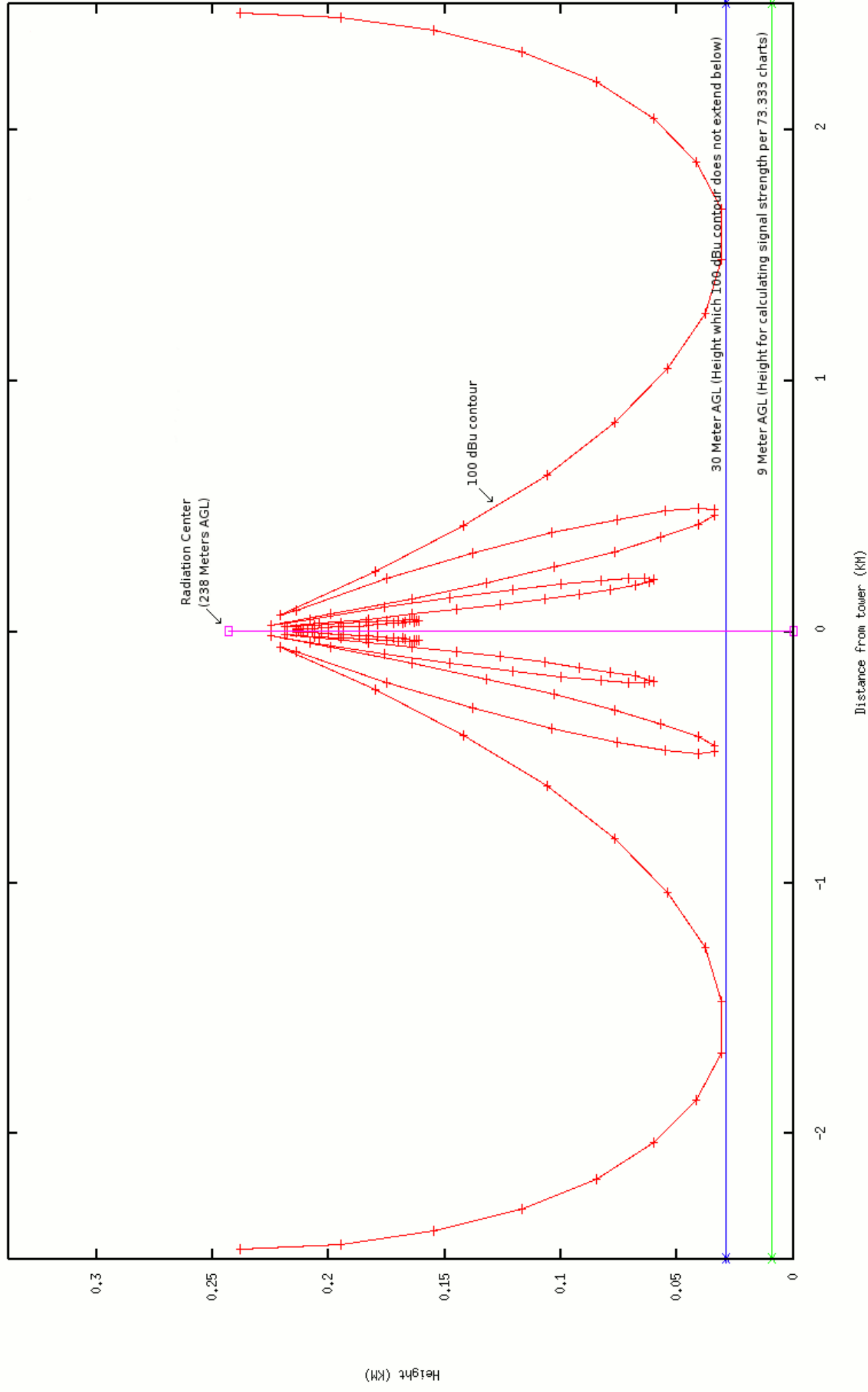
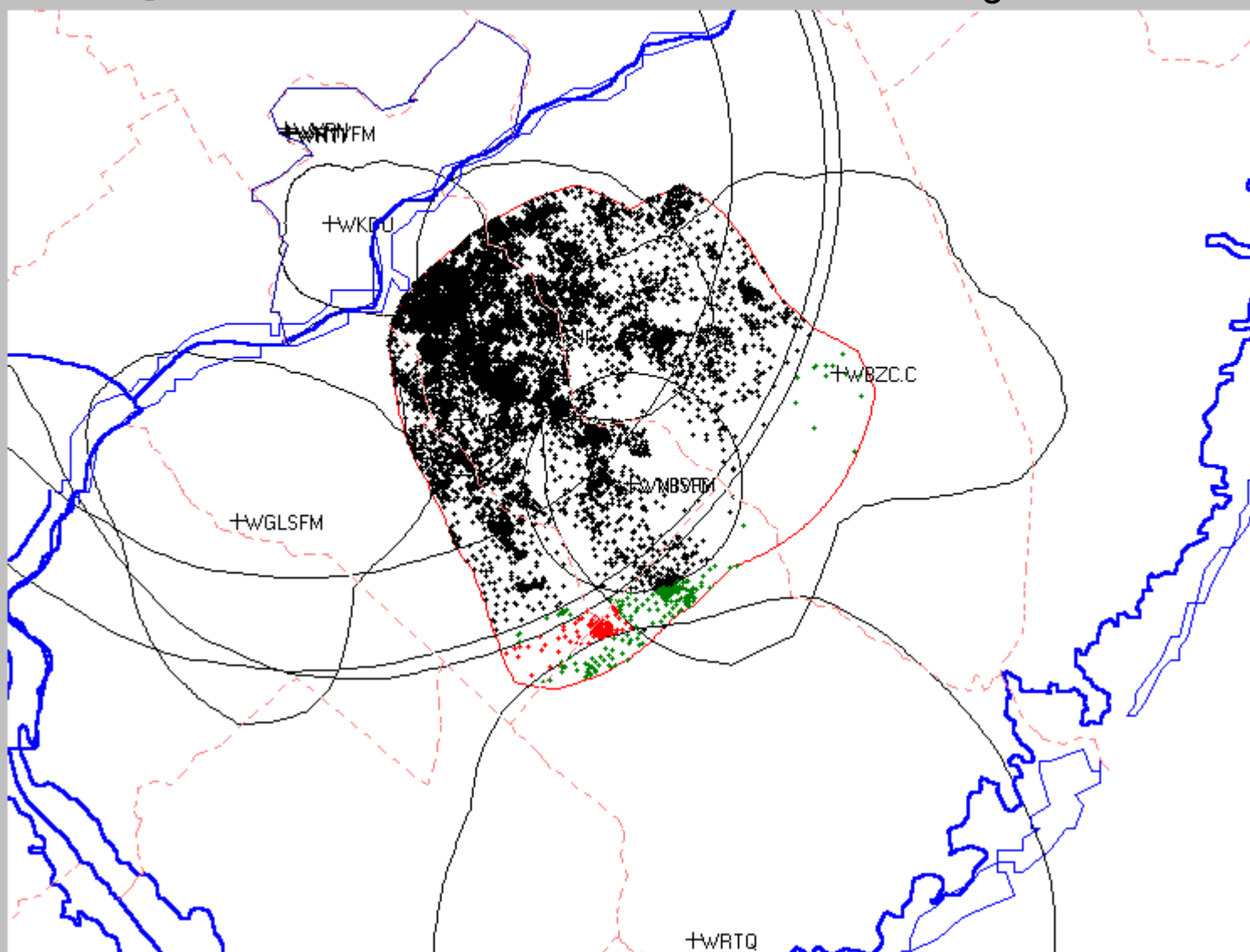


Figure 13

100 dBu contour, Scala 4-Bay Vertical YAGI, 1.233 kW





201A	LIC	WNJSFM	Berlin	NJ	New Jersey Public Broadcastin	48486	0.00	236
203B	LIC	WXPB	Philadelphia	PA	Trustees Of The University Of	68229	48.85	316
205B1	CP	WBZC.C	Pemberton	NJ	Burlington County College	7844	23.31	62
208A	LIC	WSJI	Cherry Hill	NJ	Broadcast Learning Center, In	7045	17.15	328
209A	LIC	WGLSFM	Glassboro	NJ	Rowan University	57778	39.15	265
211B	LIC	WRTI	Philadelphia	PA	Temple Univ. Of The Commonwea	65190	48.19	316
215B	LIC	WHYYFM	Philadelphia	PA	Whyy, Inc.	72336	48.57	316
217B1	LIC	WRTQ	Ocean City	NJ	Temple U. Of The Commonwealth	65176	45.64	172
218A	LIC	WDBK	Blackwood	NJ	Camden County College	8468	17.82	291
219A	LIC	WKDU	Philadelphia	PA	Drexel University	17596	39.29	311

Distance (km)

Find Stations

Delete Station

200

Mark Pops

☒ Hide Unused Sta☒ Hide Zeros

Load List Box

Form Print

Print Centroid

Plot Scale

Plot Stations

600

Plot Pops

Graphics

Receiving First NCE Service

4120 / 636354 (0.65%)

Receiving 2nd NCE Service

7953 / 636354 (1.25%)

Total New Service

12073 / 636354 (1.90%)