Exhibit 1

TECHNICAL CHARACTERISTICS

The applicant requests authority to operate three transmitters which together comprise a system. The characteristics of each transmitter are given on the following page.

As described in Exhibit 2, Viacel has developed the means to provide video, audio and data to selected addressees within a given area. It seeks this experimental license to demonstrate the effectiveness of its system, including the lack of harmful interference to television stations operating on adjacent channels.

Viacel has an agreement with Cavalier Group, LLC, licensee of WPWU948, to use its spectrum in the New York City area to carry out these tests. Viacel's experimental license will provide it with the flexibility to modify its system as needed, and also to empirically demonstrate that its system may operate in the same area as adjacent channel television facilities. Viacel seeks to demonstrate that it should be permitted to determine interfering signal levels from its fixed transmitter sites using recognized propagation formulae, as is the case with television station, which also transmit from fixed sites. Viacel is also filing a request for waiver of Section 26.70 of the Commission's rules to enable it use fixed site locations in its interference calculation, which is necessary for it to implement its system nationwide.

Troy Tower Transmitter
(A) Frequency: 710MHz-716MHz (Ch. 54) & 740MHz-746MHz (Ch 59)
(B) RF Power=100W
(C) Effective Radiated Power=1250W
(D) Mean
(E) Emission Designator=W7D
(F) Modulating Signal= QPSK, 16QAM, 64 QAM (8K DVB-COFDM)
(G) Bandwidth=6MHz
Location: Roof of 380 Mountain Rd. Union City NJ 07087
40° 45' 40.2" N 74° 01' 42.7" W (NAD 88)
Directional Antenna 55° horizontal plane 120° vertical plane=0°
(13) Rhode&Schwarz SV-7000 transmitter
(14) No
(15) No

ATT Building Transmitter
(A) Frequency: 710MHz-716MHz (Ch. 54) & 740MHz-746MHz (Ch 59)
(B) RF Power=100W
(C) Effective Radiated Power=1250W
(D) Mean
(E) Emission Designator=W7D
(F) Modulating Signal= QPSK, 16QAM, 64 QAM (8K DVB-COFDM)
(G) Bandwidth=6MHz
Location: Roof of 32 Ave of Americas. New York NY 10013
40° 43' 12.5" N 74° 00' 15.6" W (NAD 88)
Directional Antenna 55° horizontal plane 30° vertical plane=0°
(13) Rhode&Schwarz SV-7000 transmitter
(14) No
(15) No

93rd Street Transmitter
(A) Frequency: 710MHz-716MHz (Ch. 54) & 740MHz-746MHz (Ch 59)
(B) RF Power=100W
(C) Effective Radiated Power=1250W
(D) Mean
(E) Emission Designator=W7D
(F) Modulating Signal= QPSK, 16QAM, 64 QAM (8K DVB-COFDM).
(G) Bandwidth=6MHz
Location: Roof of 300E 93rd Str. New York NY 10025
40° 46' 48.9" N 73° 56' 50.0" W (NAD 88)
Directional Antenna 55° horizontal plane 210° vertical plane=0°
(13) Rhode&Schwarz SV-7000 transmitter
(14) No
(15) No

Exhibit 2

Interference Analysis
The Viacel Network

By Meric Adriansen
Viacel Corporation
9/9/2003

The Viacel Corporation has developed, and is in the process of rolling out, a broadcast data transmission network, utilizing spectrum it acquired or has made lease arrangements with spectrum owners that have acquired spectrum in auction 44 and 49 (Lower 700 MHz Band). Viacel's system broadcasts at relatively low power from fixed sites within its particular coverage area. It will provide public safety and other governmental services with the unique ability to reach desired individuals or groups of individuals wherever they may be located at a given time. It will also provide subscribing members of the public with the means to access vital and desired information, including, but not necessarily limited to, real time weather and traffic alerts, breaking news, and entertainment programming in both video and audio forms.

However, to fully implement its system at the present time, Viacel requires a waiver of the spacing requirements contained in 47 C.F.R. 27.60. This waiver is fully justified and will serve the public interest, as shown by the following:

The Commission adopted flexible use provisions, including mobile two way transmission services, for the use of this spectrum, which is being vacated by television broadcasters. As a result, it imposed stringent interference protection requirements to protect the incumbent analog and digital TV broadcasters that will still be broadcasting in the lower 700 MHz spectrum until the digital TV transitions completes.

Specifically, due to the nature of mobile use and the difficulty in modeling the congregation of mobile transmitters, the TV/DTV interference protection criteria applicable to this spectrum; 47 CFR 27.60 sets minimum separation distances for adjacent and co-channel services to protect the hypothetical Grade B service contour of the incumbent TV or DTV broadcaster (88.5 km (55 mile) or 64 dBμV/m for TV and 41 dBμV/m for DTV).

Viacel is unable to properly implement its system in, e.g., the New York City area with these separation requirements. However, they need not apply to Viacel's network which uses fixed broadcast transmitters that are easy to model and whose signal transmission characteristics are akin to low power DTV services. Thus, the concerns raised by mobile transmitters are not present for Viacel's system. Viacel should instead be subject to the interference calculations used for incumbent TV and DTV broadcasters as specified in OET Bulletin No. 69 (Longley-Rice Methodology for Evaluating TV Coverage and Interference). Use of this method will permit Viacel to promptly implement its system and begin providing the unique benefits which obtain. As 47 CFR 27.60 does not permit the use of this method, Viacel respectfully requests a waiver of that provision.

The Viacel network utilizes low power DVB DTV transmitters (typically 100W) that are coupled to vertically polarized directional antenna systems with a typical gain of 11dB to create a typical signal with an ERP of 1250W. Typical antenna height is 100m HAAT. A large service area is created by operating a number of transmitters as a Single Frequency Network (SFN) using the DVB-8K standard. The design goal of the network is to over time create a ubiquitous coverage area with an average C/N of 22dB.

Table 4: Strong Desired Signal for TOV interference

Channel Offset	D/U Ratio, dB	
	DTV into Analog	DTV into DTV
-1 (lower adjacent)	N/A	N/A
0 (co-channel)	+53	+15
+1 (upper adjacent)	N/A	N/A

Table 5: Strong Desired Signal for TOA interference

Channel Offset	D/U Ratio, dB	
	DTV into Analog	DTV into DTV
-1 (lower adjacent)	N/A	N/A
0 (co-channel)	+19	N/A
+1 (upper adjacent)	N/A	N/A

Viacel is aware that the interference criteria for co- and adjacent channels listed in table 5A of OET bulletin No. 69, is based on DTV based on the 8VSB standard and that differences between 8VSB and the DVB standard will require some modifications to the D/U ratios to assure that no interference to incumbent broadcasters will occur. If the Commission approves our request, we will use these modified D/U ratios as a guideline, but ultimately believe that real world field conditions should be the ultimate guideline for interference since our intent is to roll out a timely new service without interfering with temporary incumbent Analog and Digital TV broadcasters.

To give guidance to the Commission on the proper D/U ratio for our service, we have looked at various laboratory and field studies as well planning factors adopted around the world. The numbers that will be cited here are only for DTV interfering into DTV and Analog TV as interference to our service is not prohibited:

Table 1 summarizes the FCC interference criteria for Co- and adjacent channels as per OET 69 Table 5A:

Table 1: FCC planning Factors[i]

Channel Offset	D/U Ratio, dB	
	DTV into Analog	DTV into DTV
-1 (lower adjacent)	-17	-42
0 (co-channel)	+34	+15
+1 (upper adjacent)	-12	-43

Further tests conducted by the Advanced Television Technology Center (ATTC) and reported in the Memorandum Opinion And Order On Reconsideration Of The Sixth Report And Order (FCC 98-24 Paragraph 88) recommended that the minimum desired-to-undesired (D/U) ratio for DTV-to-DTV lower adjacent channel operation should be about -23 dB rather than about -42 dB; and that the minimum D/U ratio for DTV-to-DTV upper adjacent channel operation should be about -21 dB rather than about -43 dB. The FCC also in that report decided to adopt a more conservative RF transmitter mask that would enable the recommended D/U ratios to be achieved. (FCC 98-24 Paragraph 91-92).

Dr Yiyan Wu. in his paper at the ICCE 99[ii] conference reported the following protection ratios as adopted in Canada the US and EBU. The Canadian and US protection ratios are for 8VSB DTV and NTSC analog TV in 6 MHz channels. The EBU ratios are for various flavors of COFDM DTV and various flavors of PAL and SECAM analog TV in 7 and 8 MHz channels.

Table 2: Canadian Protection Ratios[iii]

Channel Offset	D/U Ratio, dB	
	DTV into Analog	DTV into DTV
-1 (lower adjacent)	-16	-27
0 (co-channel)	+34	+16.5
+1 (upper adjacent)	-12	-27

Table 3: US Protection Ratios[iv]

Channel Offset	D/U Ratio, dB	
	DTV into Analog	DTV into DTV
-1 (lower adjacent)	-17	-28
0 (co-channel)	+34	+15
+1 (upper adjacent)	-12	-26

Table 3: EBU Protection Ratios[vi]

Channel Offset	D/U Ratio, dB	
	DTV into Analog	DTV into DTV
-1 (lower adjacent)	-5~-11	N/A
0 (co-channel)	+34~+37	+19
+1 (upper adjacent)	-1~-10	N/A

In an earlier paper[vii] Dr. Y. Wu, B. Ledoux and M. Guillet of the Communications Research Centre in Ottawa Canada, evaluated a 6 MHz COFDM system that was modified for 6 MHz operation and conducted laboratory and field testing that compared this system to an 8VSB system and reported their interference performance. The testing was conducted for a desired NTSC signal that was strong (-15dBm), moderate (-35dBm) and weak (-55dBm). and for a desired DTV signal that was strong (-28dBm), moderate (-53dBm) and weak (-68dBm). Interference was measured for Threshold of Visibility (TOV) and Threshold of Audibility (TOA). Tables 4 –9 show the results obtained from this testing.

Table 6: Moderate Desired Signal for TOV interference

Channel Offset	D/U Ratio, dB	
	DTV into Analog	DTV into DTV
-1 (lower adjacent)	+1.9	N/A
0 (co-channel)	+53.5	+14.5
+1 (upper adjacent)	-4.5	N/A

Table 7: Moderate Desired Signal for TOA interference

Channel Offset	D/U Ratio, dB	
	DTV into Analog	DTV into DTV
-1 (lower adjacent)	N/A	N/A
0 (co-channel)	+20	N/A
+1 (upper adjacent)	-9	N/A

Table 8: Weak Desired Signal for TOV interference

Channel Offset	D/U Ratio, dB	
	DTV into Analog	DTV into DTV
-1 (lower adjacent)	-1	<-36
0 (co-channel)	+49.5	+18
+1 (upper adjacent)	-5	<-36

Table 9: Weak Desired Signal for TOA interference

Channel Offset	D/U Ratio, dB	
	DTV into Analog	DTV into DTV
-1 (lower adjacent)	-17	N/A
0 (co-channel)	22	N/A
+1 (upper adjacent)	-9	N/A

The COFDM technical group in its paper presented in December of 2000 titled VSB/COFDM Project 8VSB/COFDM Comparison Report reported the following DTV planning factors:

Table 10: 8VSB DTV

Channel Offset	D/U Ratio, dB	
	DTV into Analog	DTV into DTV
-1 (lower adjacent)	-8	-32
0 (co-channel)	+38	+15
+1 (upper adjacent)	-7	-36

Table 11: COFDM DTV

Channel Offset	D/U Ratio, dB	
	DTV into Analog	DTV into DTV
-1 (lower adjacent)	-2	-32
0 (co-channel)	+38	+19.5
+1 (upper adjacent)	-7	-32

Anatel in their evaluation of 8VSB and COFDM for consideration of the DTV standard for Brazil[viii] conducted tests that compared the interference performance characteristics of both systems. Although the testing was done for 6 MHz Channels, the analog TV system was PAL. Reference for the desired analog signal is –47dBm and -60dBm for the desired digital signal. The following results were obtained::

Table 12: 8VSB DTV

Channel Offset	D/U Ratio, dB	
	DTV into Analog	DTV into DTV
-1 (lower adjacent)	-9	-27
0 (co-channel)	+37	+15
+1 (upper adjacent)	-8	-27

Table 13: COFDM DTV

Channel Offset	D/U Ratio, dB	
	DTV into Analog	DTV into DTV
-1 (lower adjacent)	-9	-25
0 (co-channel)	+38	+20
+1 (upper adjacent)	-8	-24

Analyzing tables 1-13, we would like to suggest the following initial protection ratios for our service. If after "in the field" experience we determine that further protection is needed, we will modify these recommendations and advise the FCC.
The numbers were established by interpreting the distribution of previous tests and weighing factors such as date of the tests, stage of development of the tested products and favoring a conservative approach. We have also looked at protection ratios for taboo channels, but do not believe that they will need to be considered, as the signal level in our networks are considered too by weak by DTV standards. We will however conduct further testing to verify this assumption.

Additionally we will also employ band-pass filters in our transmitters to comply with the FCC mandated RF mask for DTV transmitters as per FCC 98-24 Paragraph 91-92.

Considering that on the average the signal from our transmitters is 30 dB below a typical full power analog TV station and 24 dB below a typical full power DTV station we believe that all the figures in table 14 will be easily achieved and no interference to incumbent broadcasters will occur. We therefore request from the Commission to grant our request for a waiver and allow us to adopt the protection ratios shown in the following table together with the methodology described in EOT 69.

Table 14: Protection Ratios for an 8K COFDM DVB system into Analog NTSC and 8VSB DTV System

Channel Offset	D/U Ratio, dB	
	DTV into Analog	DTV into DTV
-1 (lower adjacent)	-9	-25
0 (co-channel)	+38	+18
+1 (upper adjacent)	-7	-25

Example:

We will examine one of the test transmitters of the Viacel Network. The Troy Towers transmitter located across the river from Manhattan in New York City has the following engineering parameters:

Location: 40° 45' 40.2" N 74° 01' 42.7" W
1250W ERP 743 MHz (Ch 59)
HAAT 107m Antenna: 55 Deg. Directional Yagi Vertical Polarized

It produces the following field strength plot taking into consideration the terrain model

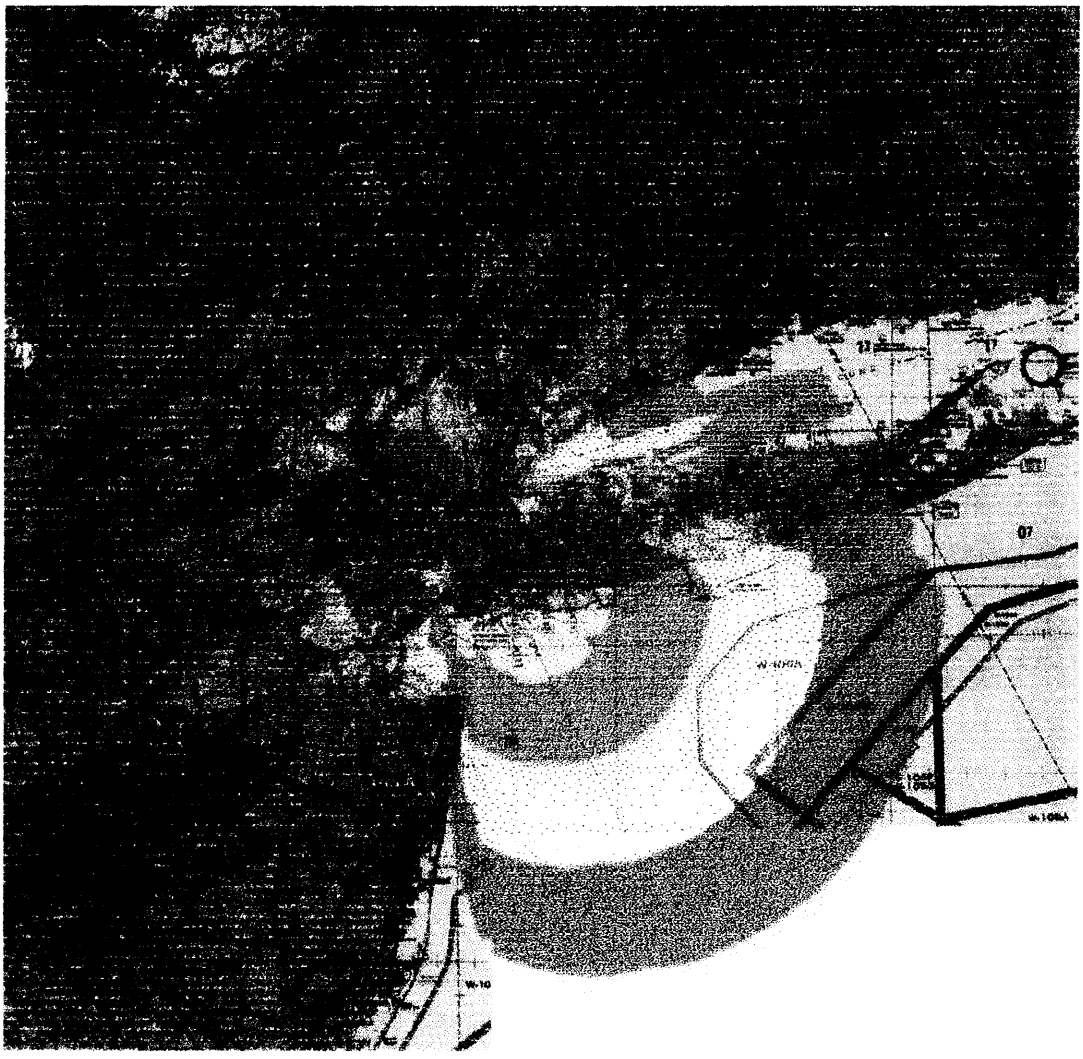

Figure 1 Viacel Troy Towers Transmitter FS Plot (200m)

120>E>85 85>E>75 75>E>65 65>E>55 55<E<45 45<E<35 E=dBμV/m

More realistically using the Manhattan building elevation data, the field strength would look as follows:

Figure 2. Viacel Troy Towers Transmitter FS Plot (10m)

Analyzing this plot, we realize that the strongest signal area of the Troy towers transmitter is from the transmitter toward Manhattan traveling over the Hudson river. But by the time the signal gets to Manhattan it has attenuated to around 100 dBμV/m. In Manhattan the useable signal level is from 100 to 65 dBμV/m. (Red, Green and yellow areas).

As an example, consider WNJB, Channel 58 at New Brunswick, NJ, an incumbent broadcast station which must be protected from interference. Its transmitter, located about 45 km from Viacel's Troy towers transmitter site, does not meet the spacing required by 47 CFR 26.70. Thus, without a waiver of that rule, Viacel would not be permitted to use this site. However, grant of the requested waiver allows Viacel to compute the interference level, using the following engineering parameters for WNJB:

Location: 40 ° 37' 17.00" N 74 ° 30' 15.00 W
1320kW ERP 737 MHz (Ch 58)
HAAT 223m Antenna: Omni Horizontal Polarized

The WNJB transmitter produces the following field strength plot taking into consideration the terrain model:

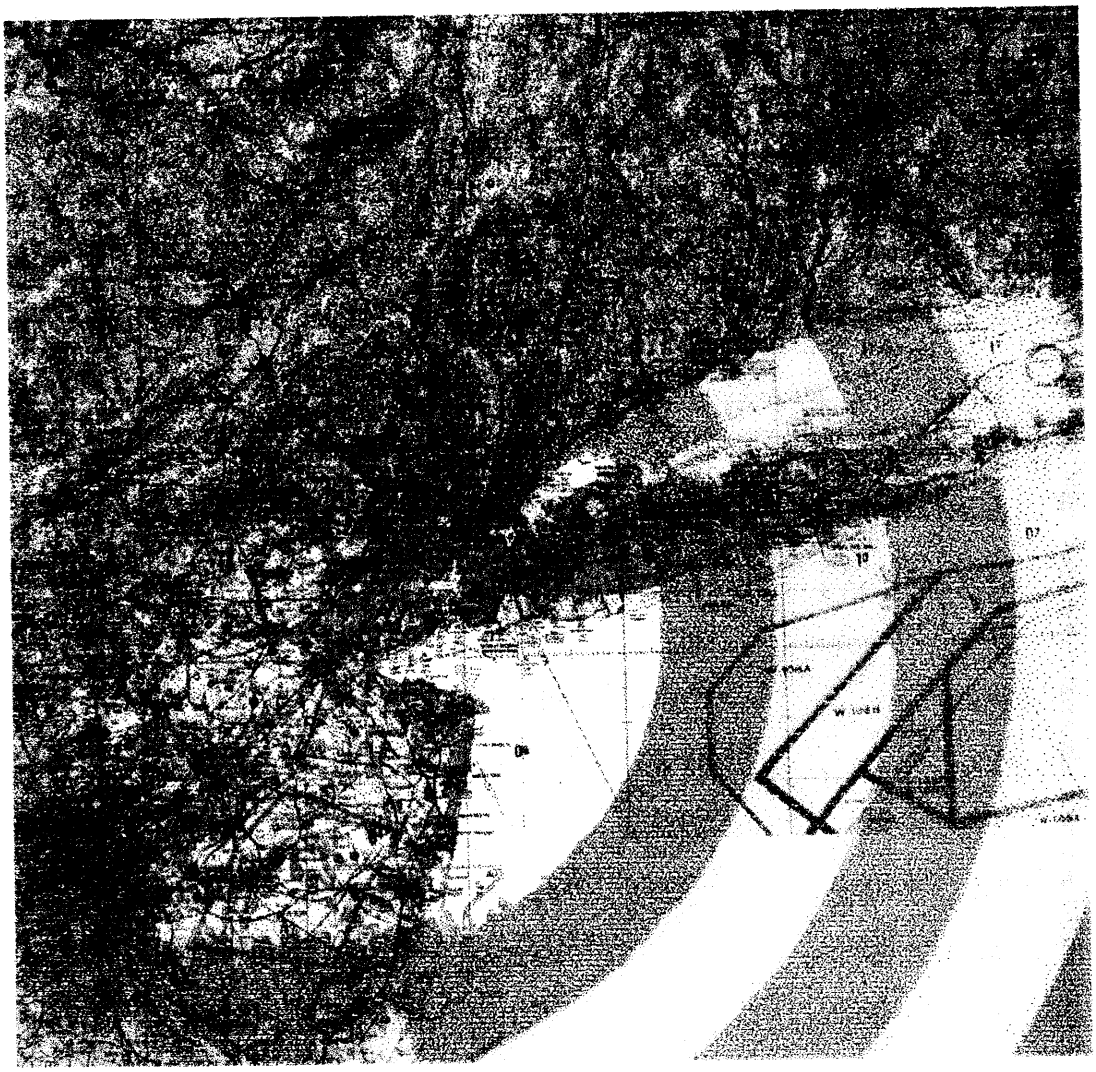

Figure 3 WNJB FS Plot (200m)

120>[redacted]>85 85>[redacted]>75 75>E>65 65>[redacted]>55 55>[redacted]>45 45>E>35 E=dBμV/m

Next we compare the field strength at each point for WNJB and the Viacel Troy towers transmitter. We apply the planning factor of –7 dB from table 14 as the allowed D/U ratio between the two transmitters and calculate D/U ratios that are above those permitted. The results are displayed in figure 4. As expected, the only areas where the D/U ratios are outside the allowed parameters are very close to the transmitting beam of the Viacel transmitter. This signal though, due to its low power, gets rapidly attenuated to within the allowed D/U ratio before it reaches Manhattan, just ¼ miles away. In any case, the interference created is well within the acceptable interference criteria of less than a 2% loss of service as described by OET. 69. Analyzing these plots further, we see that the field strength of the Viacel Troy towers transmitter is 12dB below the acceptable D/U threshold in the primary coverage area of Manhattan where the WNJB signal is between 90 to 105dBμV/m, and the Viacel Troy towers signal is between 65 to 100dBμV/m.

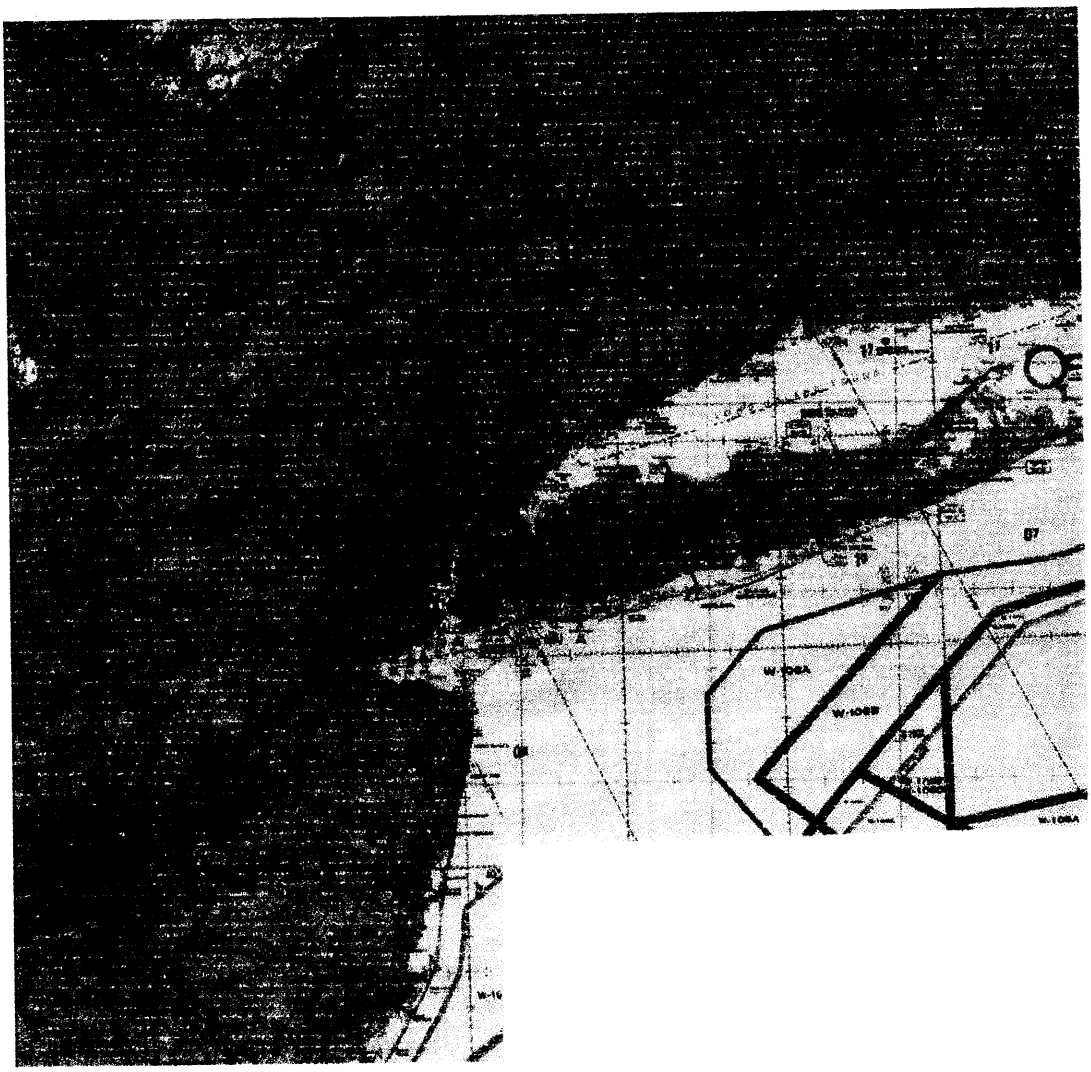

Figure 4: D/U Ratios Viacel Troy – WNJB

-48<[redacted]<-60 -40<[redacted]<-48 -32<D/U<-40 -24<[redacted]<-32 -16<[redacted]<-24 -8<[redacted]<-16

D/U=dB No Color means a D/U of less then –7 which is a non interfering ratio

[i] OET Bulletin No. 69 Longley-Rice Methodology for Evaluating TV Covarage and Interference. FCC, July 2,1997

[ii] Performance Comparison of ATSC 8-VSB and DVB-T COFDM Transmission Systems for Digital Television Terrestrial Broadcasting, ICCE 99

[iii] Y. Wu, *et. al.*, "Canadian digital terrestrial television system technical parameters", *IEEE Transactions on Broadcasting*, to be published in 1999.

[iv] ATTC, "Digital HDTV Grand Alliance System Record of Test Results", Advanced Television Test Centre, Alexandria, Virginia, October 1995.

[v] ETSI TR 101 190v1.1.1, "Implementation guidelines for DVB terrestrial services: Transmission aspects", ETSI Technical Report TR 101 190v1.1.1 (1997-12).

[vi] ITU-R SG 11, Special Rapporteur – Region 1,"Protection ratios and reference receivers for DTTB frequency planning", ITU-R Doc. 11C/46-E, March 18, 1999.

[vii] Evaluation of COFDM for ATV transmission over 6 MHz Channels. Y. Wu, B. Ledoux and M. Guillet. Communications Research Centre in Ottawa Canada. November 15, 1995

[viii] final SET/ABERT report for establishing a digital television standard in Brazil