| Station | Channel | Interference **Caused** Area |
|---|---|---|
| WYDN, Worcester, MA | DTV-47 | 70 |
| WNDS, Derry, NH | NTSC-50 | 648 |
| WNJN, Montclair, NJ | NTSC-50 | 2,792 |
| WOCD, Amsterdam, NY | DTV-50 | 991 |
| WTBY, Poughkeepsie, NY | NTSC-54 | 38 |
| WJAR, Providence, RI | DTV-51 | 51 |

**DTV Channel 63**

Figure 8 is a map from the NTIA computer program showing the assumed WFSB DTV operation on channel 63. The following stations are predicted to cause interference within the 41 dBu noise limited service area for the assumed WFSB DTV operation on channel 63.

| Station | Channel | Interference **Received** Area |
|---|---|---|
| WBNE, New Haven, CT | NTSC-59 | 633 sq km |
| WTIC-TV, Hartford, CT | NTSC-61 | 22 |
| WMBC-TV, Newton, NJ | NTSC-63 | 1,235 |
| WRNN-TV, Kingston, NY | TSC-62 | 84 |
| WNAC-TV, Providence, RI | NTSC-64 | 41 |

The following is the calculated interference caused by the assumed DTV operation of WFSB on channel 63 to other analog (NTSC) and DTV operations.

| Station | Channel | Interference **Caused** Area |
|---|---|---|
| WBNE, New Haven, CT | NTSC-59 | 537 sq km |
| WEDY, New Haven, CT | NTSC-65 | 8 |
| WTIC-TV, Hartford, CT | NTSC-61 | 46 |
| WGGB-TV, Springfield, MA | DTV-55 | 13 |
| WMBC-TV, Newton, NJ | NTSC-63 | 2,063 |
| WRNN-TV, Kingston, NY | NTSC-62 | 638 |
| WNAC-TV, Providence, RI | NTSC-64 | 1 |

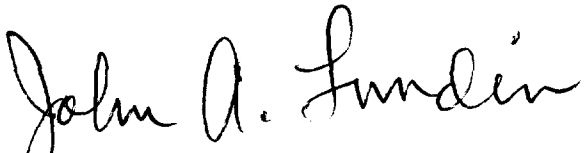
Except for the channel 33 option noted above, no other DTV channel swap appeared feasible for WFSB. Because the service and interference information for an assumed WFSB channel 33 DTV operation did not appear favorable as compared to other DTV channels, the possible impact of DTV channel 11 for WWLP (Springfield, MA) was not examined.

As demonstrated above, all potential DTV channels for WFSB have interference problems.

Unfortunately, this firm does not have the computer software to redo DTV channel allotment table in the northeast corridor which would result in a more favorable DTV allotment scheme where less interference is caused and received between analog and DTV assignments. It is our understanding, however, that this is being done by MSTV.

In summary, WPIX has demonstrated that substantial interference will be received and caused between its analog operation and the FCC's proposed DTV allotment for station WFSB.

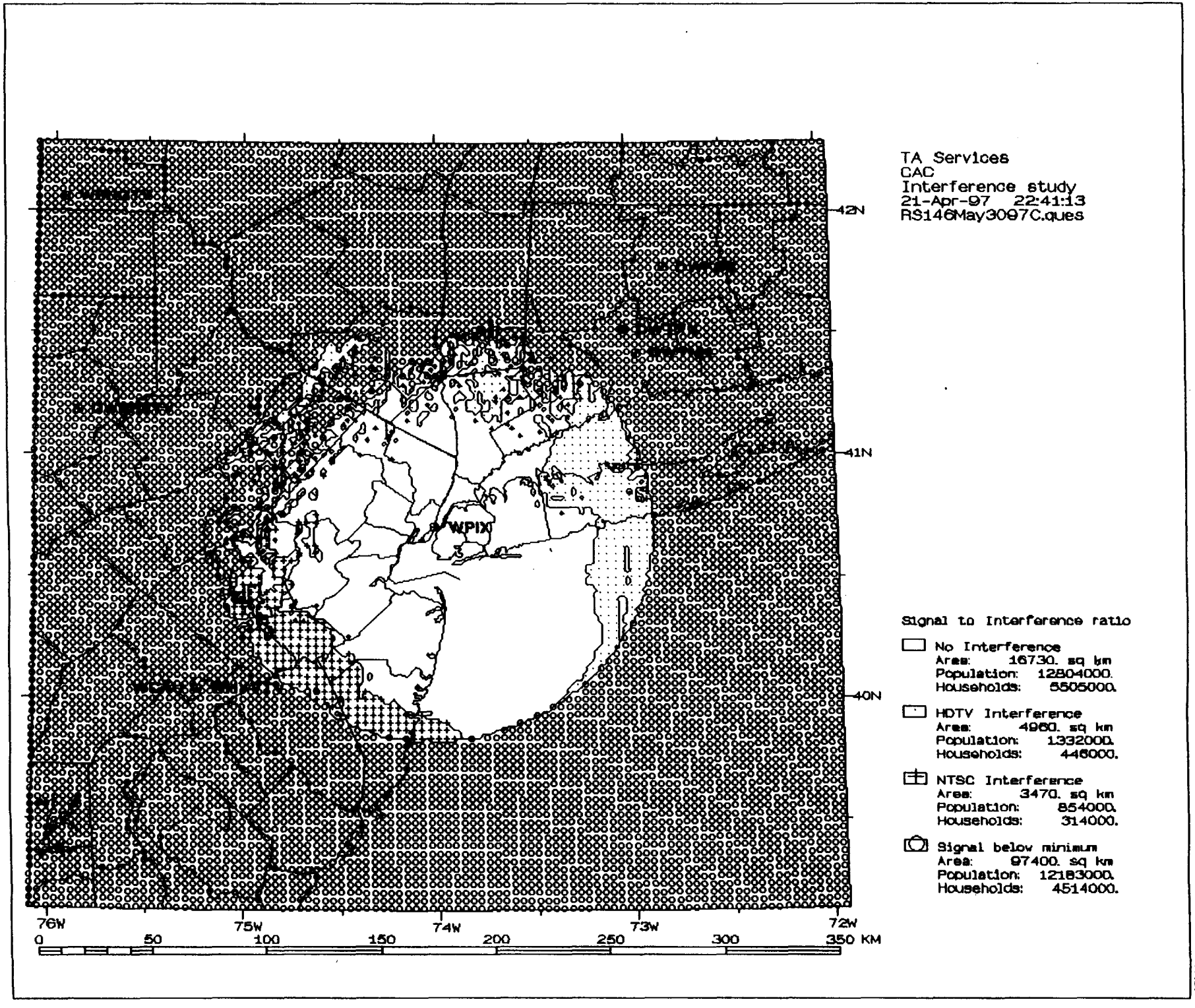
Station WPIX requests the FCC to assign an alternative DTV channel to station WFSB. If there are questions concerning this Technical Statement, please contact the office of the undersigned.



John A. Lundin

du Treil, Lundin & Rackley, Inc.
240 North Washington Boulevard, Suite 700
Sarasota, Florida 34236

(941) 366-2611
June 6, 1997




PRESENT WPIX NTSC CHANNEL 11

Figure 1

## FCC PROPOSED WPIX DTV CHANNEL 33

**Figure 2**

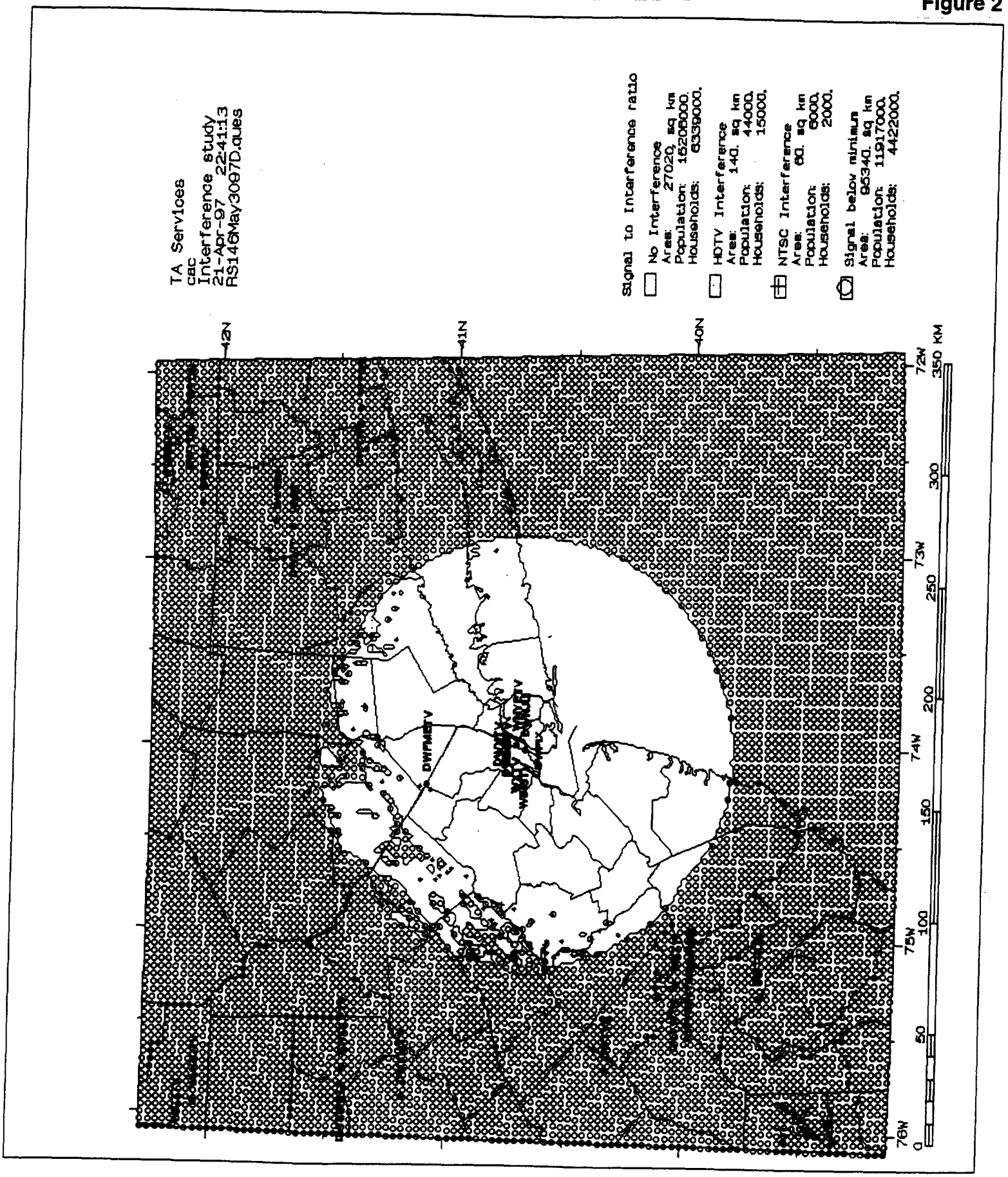


Figure 3

## PRESENT WFSB NTSC CHANNEL 3

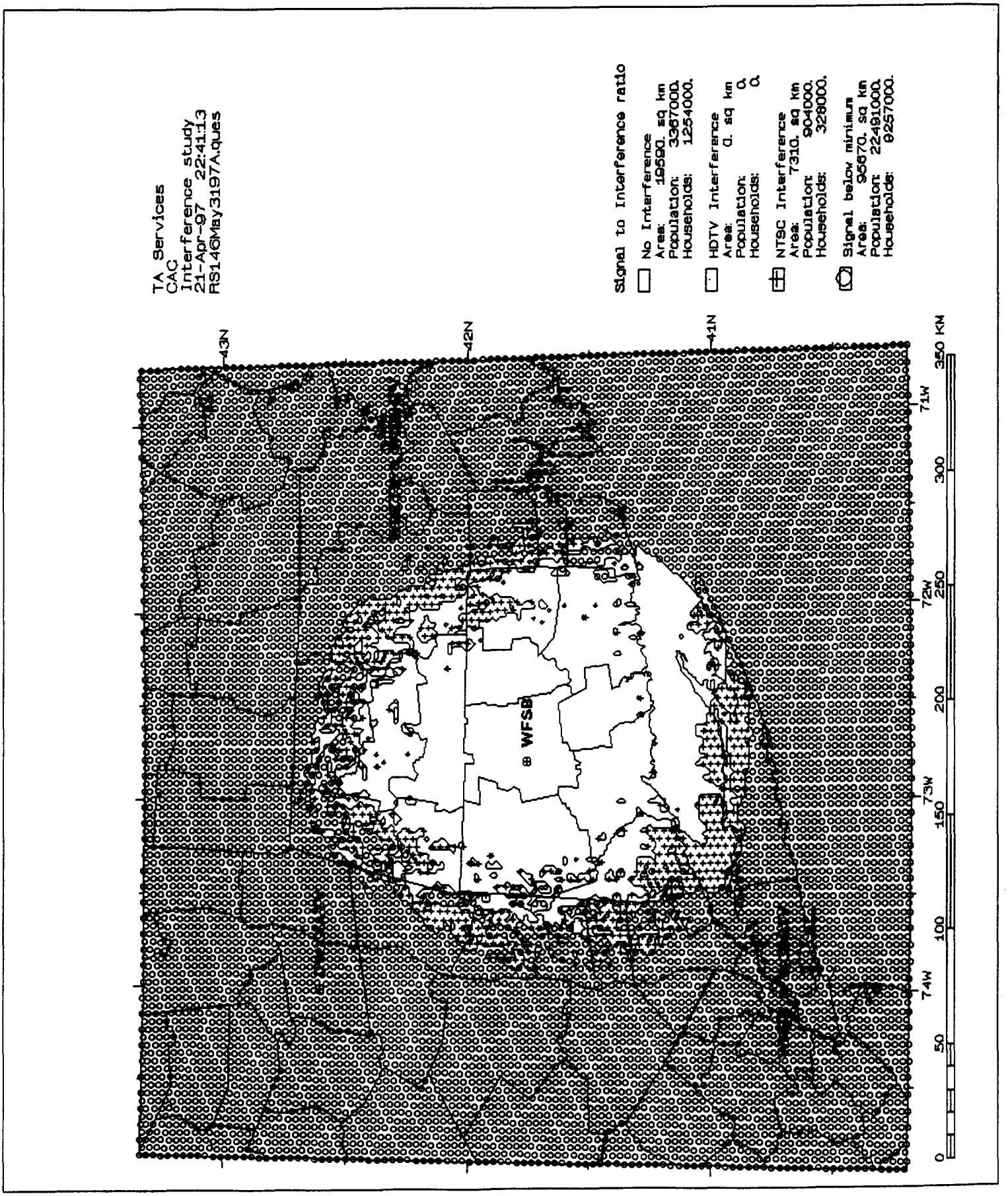
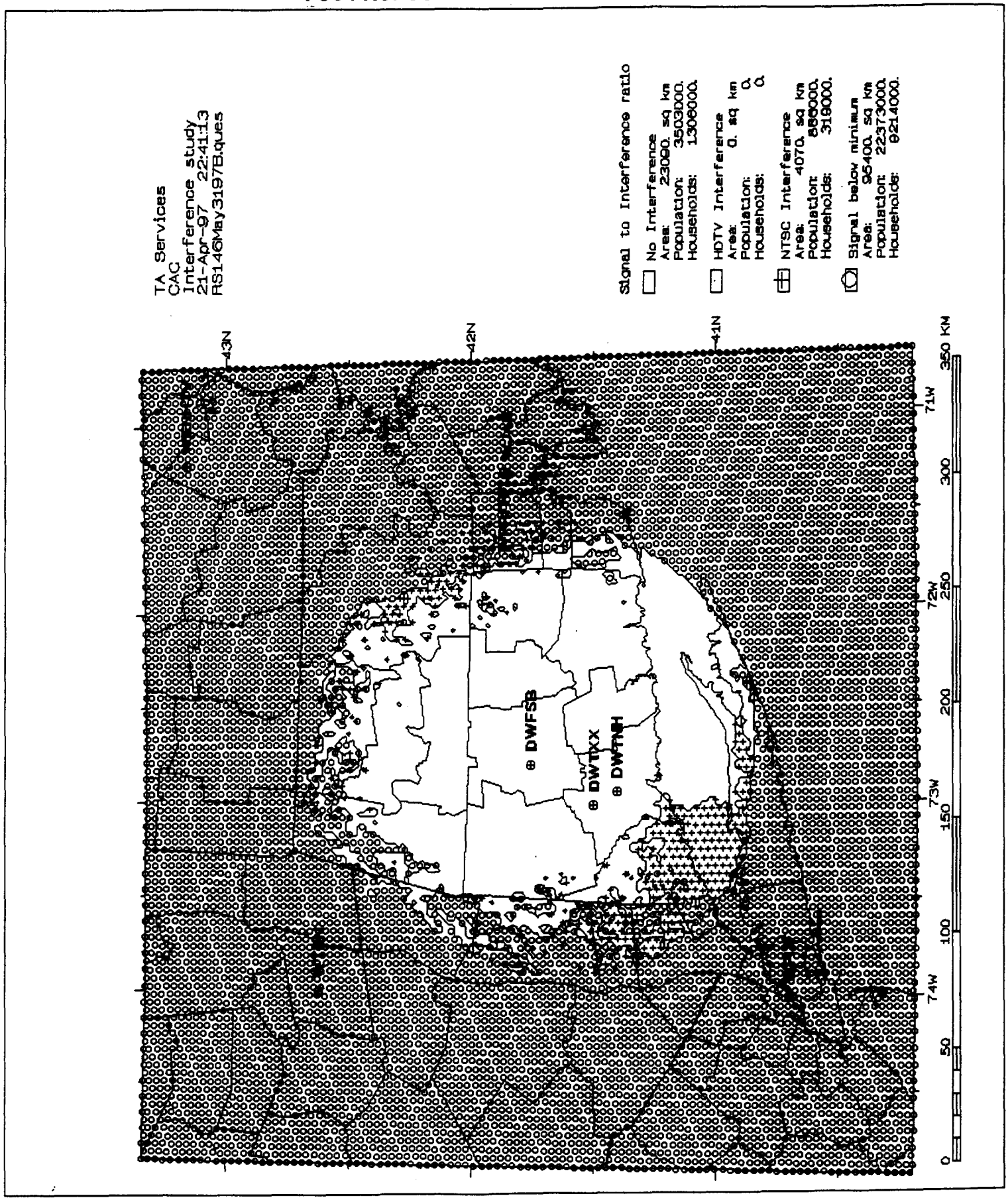


**Figure 4**

## FCC PROPOSED WFSB DTV CHANNEL 11



## ASSUMED WFSB DTV CHANNEL 31

Figure 5

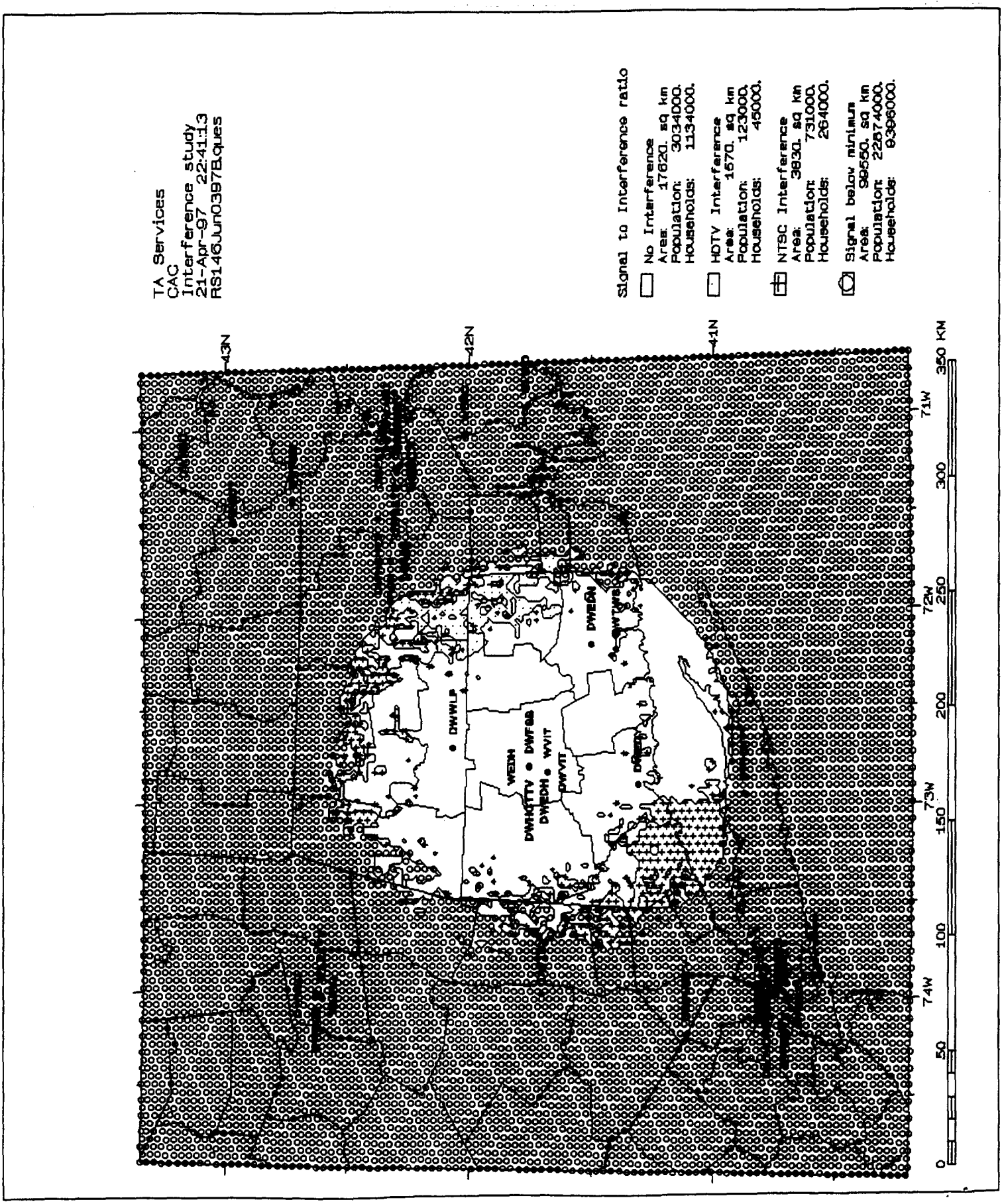


**Figure 6**

## ASSUMED WFSB DTV CHANNEL 33

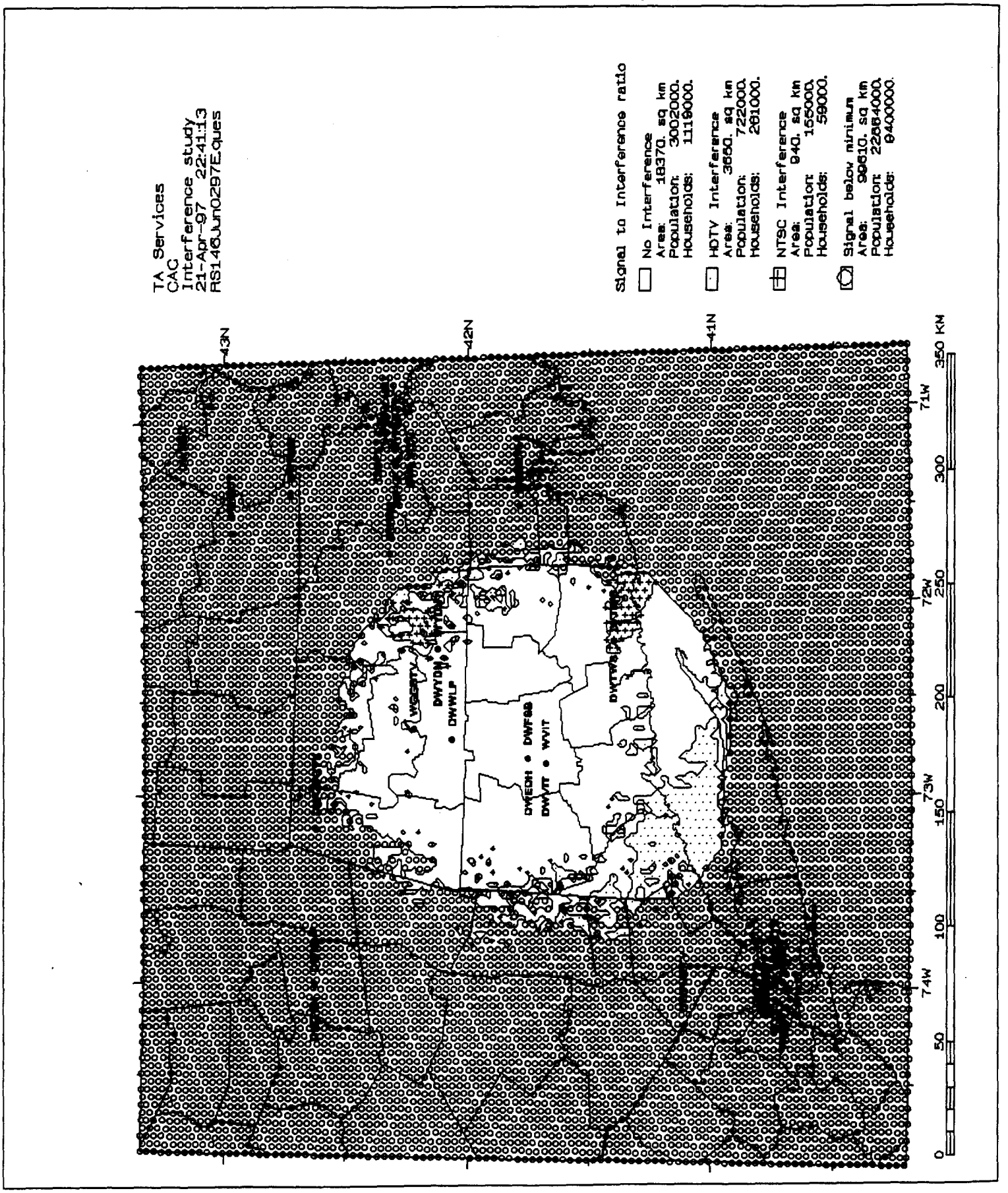


Figure 7

## ASSUMED WFSB DTV CHANNEL 50

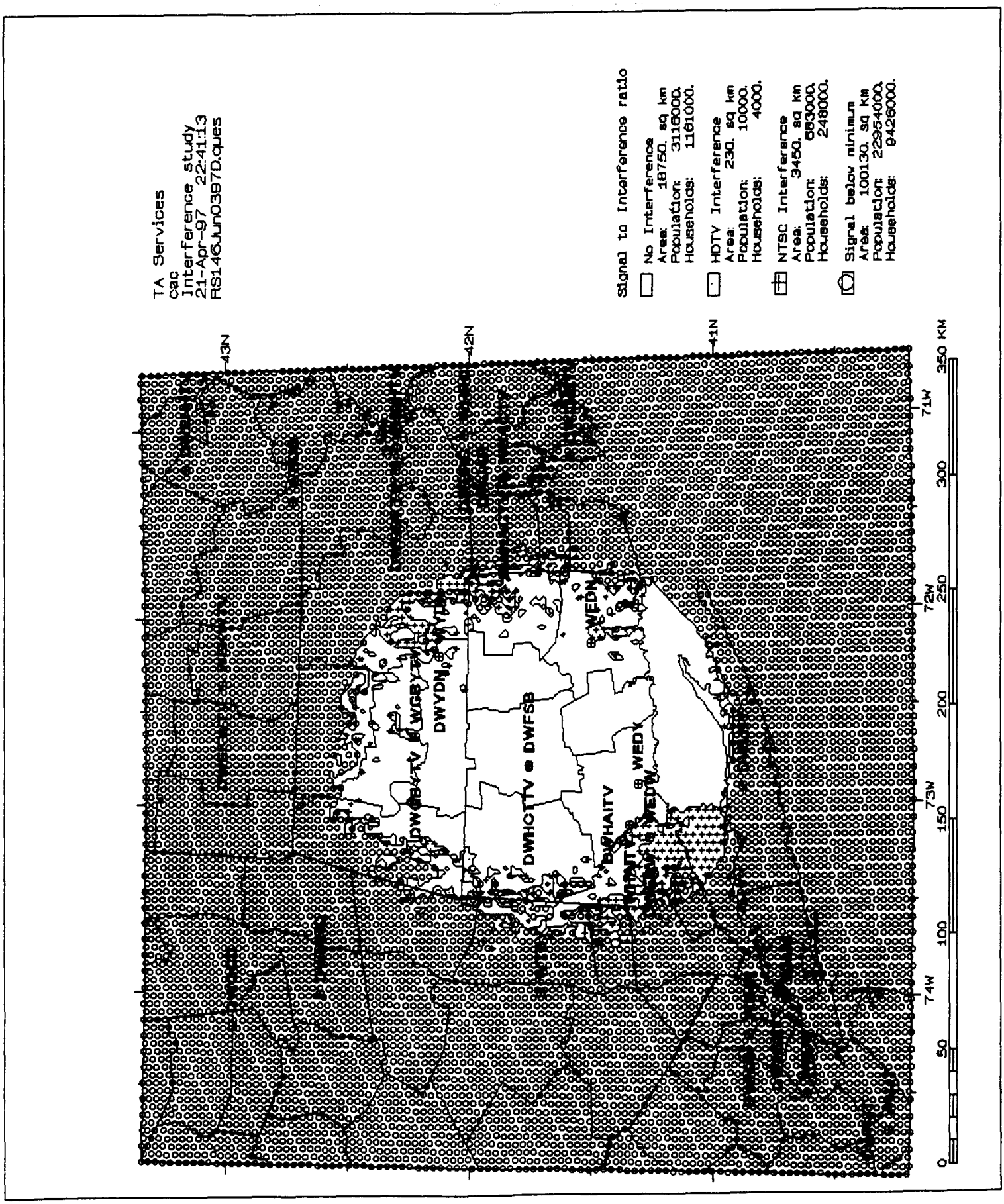
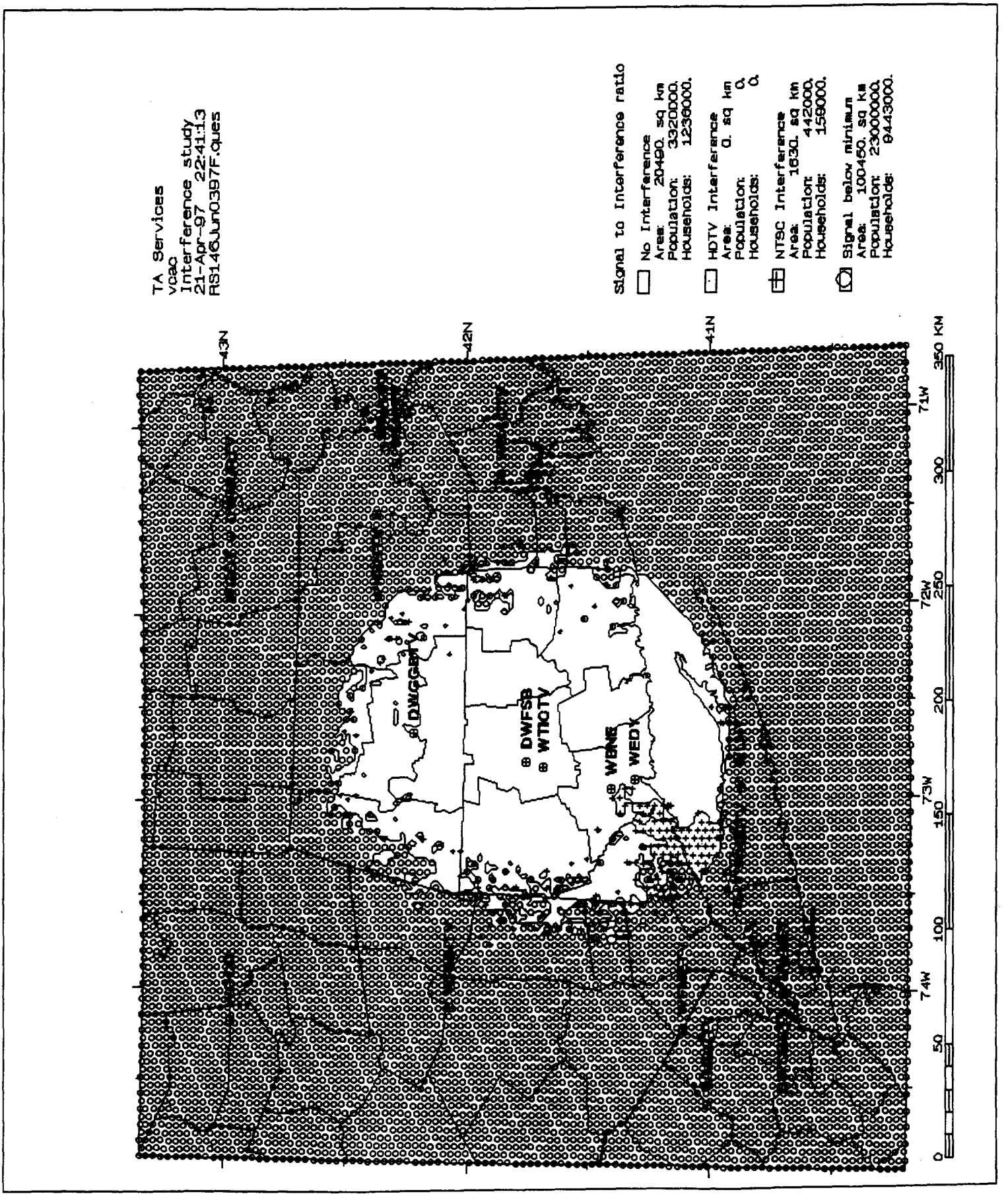


Figure 8

## ASSUMED WFSB DTV CHANNEL 63



**MLJ** *MOFFET, LARSON & JOHNSON, INC.*
*CONSULTING TELECOMMUNICATIONS ENGINEERS*

**ENGINEERING REPORT**

**1110 N. Glebe Road, Suite 800** **Arlington, VA 22201**

# ENGINEERING STATEMENT

# IN SUPPORT OF THE PETITION OF

# POST NEWSWEEK STATIONS, CONNECTICUT, INC.

# FOR RECONSIDERATION OF

# THE SIXTH REPORT AND ORDER IN MM DOCKET NO. 87-268

June 9, 1997

Post Newsweek Stations, Connecticut, Inc.
Hartford, Connecticut

Engineering Statement
in Support of the Petition of
Post-Newsweek Stations, Connecticut, Inc.
for Reconsideration of
the Sixth Report and Order in MM Docket No. 87-268

## Introduction

The firm of Moffet, Larson and Johnson, Inc. (MLJ) has been retained by Post-Newsweek Stations ,Connecticut, Inc. to make engineering studies in support of Post-Newsweek's Petition for Reconsideration filed in response to the Sixth Report and Order in MM Docket No. 87-268 (Sixth Report), released on April 21, 1997. In the Sixth Report the Commission has assigned a digital television (DTV) channel to each television station. Post-Newsweek is the licensee of station WFSB-TV, analog NTSC on channel 3 at Hartford, Connecticut. Under the Sixth Report WFSB-TV would be assigned channel 11 for the stations DTV operation to replicate the NTSC operation on channel 3.

The criteria used by the Commission for the assignment of channels and facilities produce assignments that would result in interference to the service of existing analog stations and new DTV stations. The WFSB-TV transmitting site is 155.5 kilometers ( 96.6 miles) from the transmitting site of NTSC station WPIX on channel 11 in New York, New York. This separation is much less than required for new co-channel stations (244.6 kilometers) under the new rules. As expected, interference studies have shown substantial predicted interference to WPIX-TV analog service and WFSB-TV DTV coverage.

Figure 1 is a map showing the noise-limited coverage contour of WFSB-TV DTV and predicted interference using the Institute for Telecommunication Sciences (ITS) which essentially duplicates the Commission's software. Figure 2 is a comparable map for WPIX on channel 11. These maps show the extensive interference that would result from the Commission's plan. In addition to interference, the Sixth Report shows that DTV operation on channel 11 would replicate WFSB-TV coverage to approximately 95 percent. Accordingly, studies were conducted to determine if alternate allocation plans could be developed to better replicate WFSB-TV analog coverage with less interference than under the Commission's plan.

Post Newsweek Stations, Connecticut, Inc.
Hartford, Connecticut

## Alternate Channel Studies

MLJ was requested by the Post to ascertain if a different channel could be assigned to WFSB-TV at Hartford to replace channel 11 or if an exchange of channels with another station could be achieved to reduce mutual predicted interference. At this point, it is futile to conduct studies that involve multiple changes to the Commission's table of assignments. First, there is not adequate time to conduct such studies; nor is the Commission's software available to conduct the studies. Furthermore, FCC report OST 69 which is intended to describe the interpretation of interference studies has not been published. Any proposal involving multiple channel changes is likely to cause increased interference to some station or stations and would likely be opposed. The results of the studies have shown that no other channel below channel 60 could simply be added as a substitute for channel 11 at Hartford.

To develop a substitution scenario predicted coverage contours for channels 10 through 12 were drawn in the vicinity of Hartford. If channel 11 were assigned, it could be best assigned to a station in the vicinity of Springfield, Massachusetts. Thus, the Springfield DTV channels, 33, 55, and 58 were studied for use in Hartford. The studies indicate that none of the Springfield channels are an improvement over channel 11 in Hartford.

During the MLJ studies similar studies were being conducted by the firm of duTreil, Lundin & Rackley on behalf of the Tribune Corp., licensee of station WPIX. MLJ has reviewed a draft of the WPIX statement which present details of the similar WPIX studies. Maps showing areas of interference and service and population counts for the areas are presented in the Tribune statement and hence are not repeated here.

A review of the channels indicates that an overall reallocation plan that employs UHF channels higher than channel 60 could result in less interference. For example, channel 63 could be used in Hartford for a station besides WFSB-TV. Channel 63 is a poor choice for WFSB-TV because WFSB-TV service would not be replicated on that channel because of interference. In addition, use of channel 63 in an attempt to replicate WFSB-TV coverage would result in substantial interference to the service of WMBG on channel 63 in Newton, New Jersey. Under the replication scheme WFSB-TV would receive the maximum power permitted, 1 MW and cause maximum interference to WMBG. If channel 63 is assigned, it would be better assign the channel to another station where less power is required for replication in order to minimize interference to WMBG.

Under the Commission's prior plan and the Broadcaster's Caucus plan, WFSB-TV was assigned channel 35. In both cases ERP in excess of 2000 kW would have been permitted. In the FCC case the closest co-channel assignment was a DTV for WNNE in Vermont which is 187 kilometers from WFSB-TV. Under the Caucus proposal, there were no cochannel DTV

assignments within 300 kilometers. The closest cochannel station is WYBE at Philadelphia 281.3 kilometers from the WFSB-TV site. There is much less potential for interference in these cases than when channel 11 is used. For WFSB-TV on channel 35, there is adequate cochannel separation. In addition, terrain shielding would effectively attentuate potentially interfering signals. Under the Commission's present plan channel 35 is assigned to WVIT, New Britain, Connecticut (which is in the Hartford market). WNDS, Derry New Hampshire is only 165.3 kilometers from WVIT. This illustrates the problem caused by the packing of the channels by limiting use of the higher channels.

## Other Concerns

The noise-limited coverage contours of a DTV Channel 11 station in Hartford and the NTSC station WPIX in New York overlap; there would be less than 100 miles between the stations. Thus, there is potential for both DTV service and NTSC service on channel 11 at some locations. This scenario has not been tested in the field. The interference model assumes that directional receiving antennas will be employed by viewers. However, in areas near WPIX's conventional City Grade contour, many viewers may use set-top "rabbit ears" or monopole antennas for reception. These antennas afford no front-to-back discrimination against unwanted signals. In such cases, interference would be much worse than the Commission's model predicts. The ITS DTV software was designed to yield the same predicted interference results as the FCC DTV assignment software, hence it is not feasible at this time to predict interference using the Longley Rice propagation model, but eliminating the receiving antenna front-to-back ratio used by the Commission. To illustrate the effect of ignoring antenna discrimination, conventional interference studies were completed using the propagation curves of the Commission's Rules and the interference ratios of the Sixth Report. With conventional studies, predicted interference extends well within the WPIX City Grade contour where reception on indoor antennas is expected to be common. With regard to WFSB-TV, predicted interference to channel 11 DTV services extends nearly to WFSB-TV's analog Grade A contour; in this area use of indoor antennas is expected to be less common than in the case of WPIX. As expected, the impact of considering indoor antennas would be more severe on WPIX analog service than on WFSB-TV digital service.

Under the plan adopted in the Sixth Report, DTV channel 10 would be assigned to WTNH , New Haven Connecticut which is also in the Hartford TV market. Studies show that interference to the WFSB-TV DTV operation on channel 11 would be negligible under the ground rules used by the Commission. In the studies desired to undesired adjacent channel ratios of approximately -40 dB are assumed. The ratios are based upon the receiver tests conducted on the prototype receiver. There is no guarantee that actual receivers will achieve this selectivity, particularly if relatively inexpensive DTV converters are manufactured. Such interference could possibly be controlled by collocating the DTV operations of the two stations.

Post Newsweek Stations, Connecticut, Inc.
Hartford, Connecticut

The WFSB-TV and WTNH transmitter sites are separated by 40.9 kilometers. Station WTNH is licensed to New Haven which would be obstructed by terrain if WTNH used the WFSB-TV site. Conversely, locating the WFSB channel 11 DTV operation at the WTNH site would result in increased interference to WPIX, primarily because of a reduction in distance separation.

## Conclusion

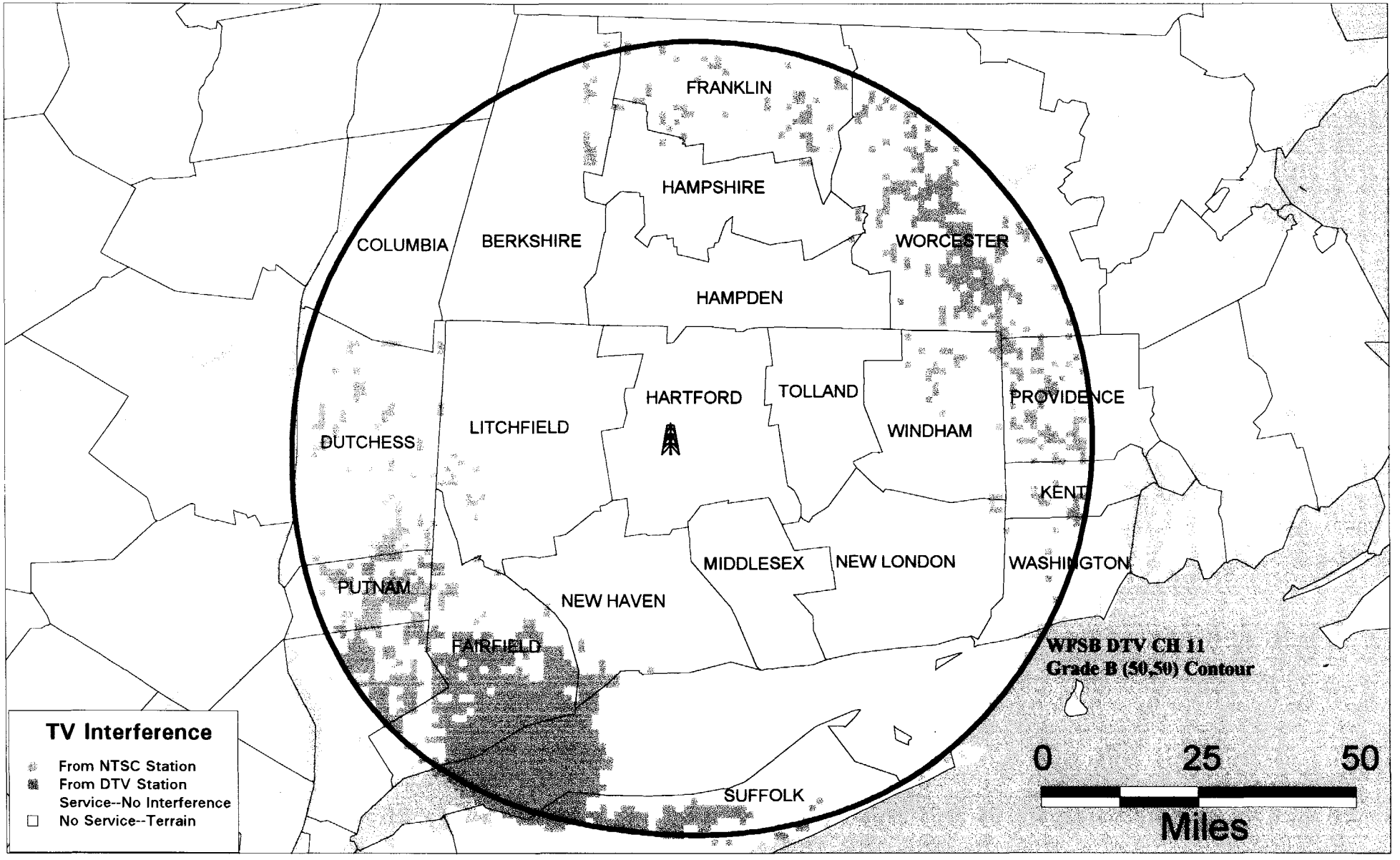
The assignment of channel 11 to WFSB-TV for DTV use is expected to result in mutual interference between WFSB-TV and the analog operation of WPIX also on channel 11. Within the constraints of the Commission's channel assignment priorities, there is no better DTV channel available for WFSB-TV. However, a reallocation plan for the northeast region could solve this problem. The present FCC plan is a step backward from the prior FCC and Caucus plans.

The undersigned certify that this statement and the attached figures were prepared by them or under their supervision.

Ann Gallagher
Senior Engineer

Joseph W. Stielper
Senior Engineer

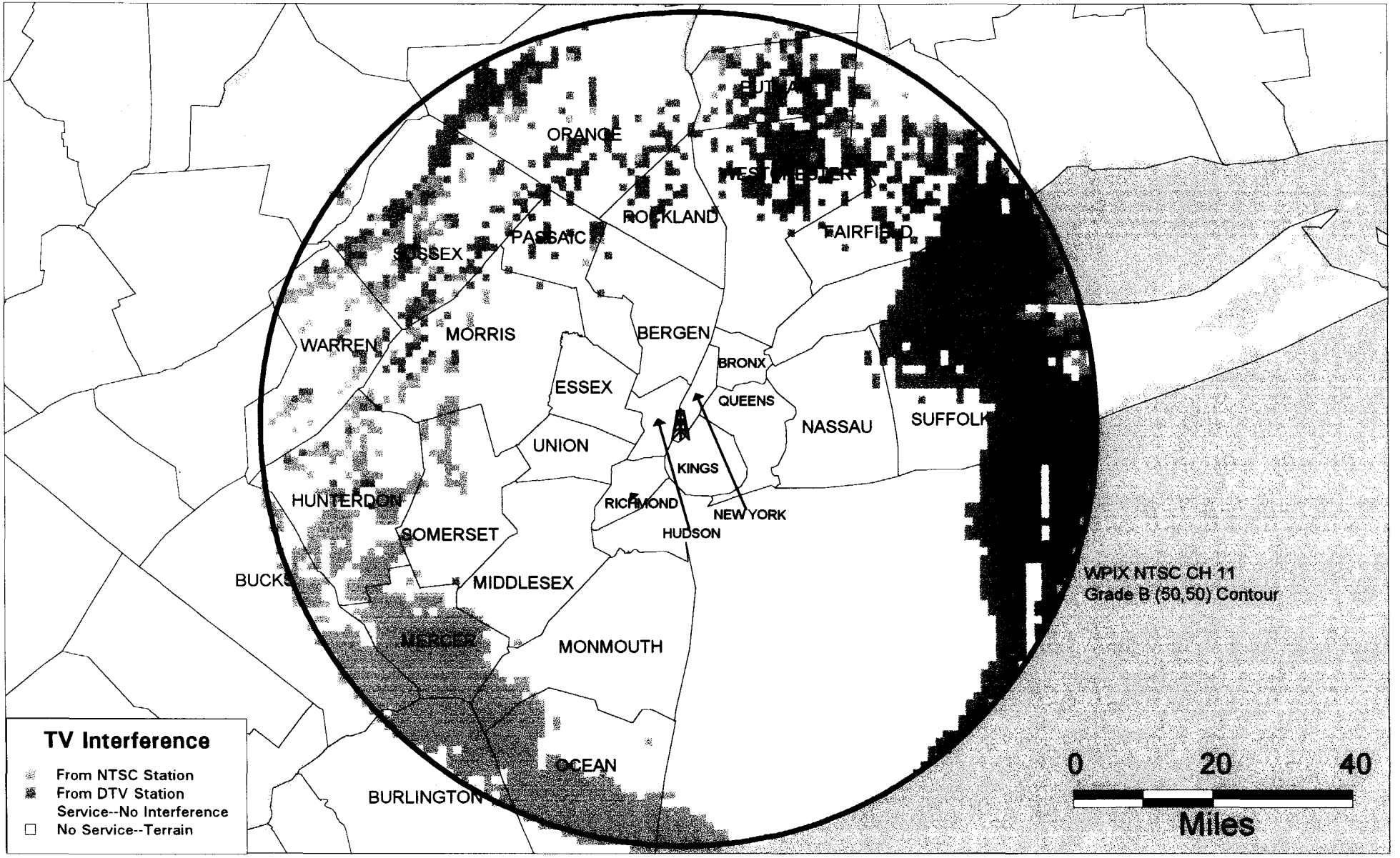
# Predicted Interference to WFSB DTV CH 11




MLJ Moffet, Larson, & Johnson, Inc.
Consulting Telecommunications Engineers

FIGURE 1

# Predicted Interference to WPIX NTSC CH 11




MLJ Moffet, Larson, & Johnson, Inc.
Consulting Telecommunications Engineers

FIGURE 2

# APPENDIX C

## TECHNICAL STATEMENT OF
## JEFF REYNOLDS OF
## DU TREIL, LUNDIN & RACKLEY, INC.

TECHNICAL STATEMENT
IN SUPPORT OF THE
PETITION FOR RECONSIDERATION OF THE
SIXTH REPORT AND ORDER IN
MM DOCKET NO. 87-268

This technical statement and associated exhibits were prepared on behalf of WTNH Broadcasting, Inc. and K-W TV, Inc. in support of a Petition for Reconsideration of the **Sixth Report and Order** in MM Docket No. 87-268 in which the Commission adopted a Table of Allotments for digital television (DTV), rules for initial DTV allotments, procedures for assigning DTV frequencies and plans for spectrum recovery. The purpose of this technical exhibit is to provide information demonstrating that the proposed DTV Table will require adjustment with respect to stations WTNH and WBNE both at New Haven, Connecticut.

WTNH, New Haven, Connecticut

TV station WTNH currently operates on NTSC channel 8 with a nondirectional antenna maximum visual effective radiated power (ERP) of 174 kilowatts (kW) and an antenna height above average terrain (HAAT) of 363 meters. In the DTV Docket, the Commission allotted DTV channel 10 to WTNH. The DTV transmitting facilities authorized are an ERP of 8.2 kW at an antenna HAAT of 363 meters. The FCC estimates that the DTV/NTSC area match will be 91.5%. As indicated below, the majority of interference to the DTV operation on channel 10 will be from the co-channel NTSC operation of WJAR on channel 10 at Providence, Rhode Island and will occur within WTNH's Nielsen Designated Market Area (DMA) where interference-free service currently exists.

Using a DTV interference analysis program available through the National Telecommunications and Information Agency (NTIA), we have determined the predicted service and interference for WTNH's current NTSC and proposed DTV operations. The NTIA program uses Version 1.2.2 of the Longley-Rice point-to-point radio propagation model. Figure 1 depicts the service and interference for the current NTSC operation on channel 8. The map shows the outline of the predicted Grade B contour, and the regions of calculated interference from other NTSC and DTV operations. The clear or unshaded area indicates where WTNH provides interference-free service. The Hartford-New Haven DMA boundaries have also been shown.[1] The following stations are calculated to cause interference within the WTNH Grade B service area:

| Call/Location | NTSC/DTV Channel | Interference Area (sq. km) |
|---|---|---|
| WHDH-TV, Boston, MA | NTSC-8 | 95 |
| WMTW-TV, Poland Spring, ME | NTSC-8 | 765 |
| WMBC-TV, Newton, NJ | DTV-8 | 3,120 |
| WWOR-TV, Secaucus, NJ | NTSC-9 | 1,190 |
| WABC-TV, New York, NY | NTSC-7 | 2,415 |
| WGAL, Lancaster, PA | NTSC-8 | 105 |

Figure 2 depicts the WTNH NTSC service and interference with consideration given to interference from WMBC's DTV operation on channel 8, only. The interference from WMBC is located on the eastern end of Long Island and the coastal counties located across Long Island Sound in Connecticut and New York. This interference area consists of 3,120 square kilometers

[1] The Hartford and New Haven DMA consists of the following Connecticut counties: Hartford, Litchfield, Middlesex, New Haven, New London, Tolland and Windham.

containing an estimated population of 1,674,000 persons and 569,000 households.

Figure 3 is the map for WTNH's proposed DTV operation on channel 10. The outline of the noise limited (36 dBu) contour for WTNH's DTV operation is shown, along with regions of calculated service and interference. The following stations are predicted to cause interference within the WTNH DTV noise limited contour:

| Call/Location | NTSC/DTV Channel | Interference Area (sq. km) |
|---|---|---|
| WTEN, Albany, CT | DTV-11 | 1,323 |
| WCAU, Philadelphia, PA | NTSC-10 | 40 |
| WJAR, Providence, RI | NTSC-10 | 3,030 |

As indicated, the majority of the interference is from the NTSC operation of WJAR on channel 10. Figure 4 depicts the WTNH DTV service and interference with consideration given to interference from WJAR's existing NTSC operation on channel 10, only. The WJAR interference area consists of 3,030 square kilometers containing an estimated population of 385,000 persons. As shown on Figure 4, the interference from WJAR will be located almost entirely within the eastern portion of the WTNH DMA in the Connecticut counties of Tolland, Windham and New London. It is estimated that 30 percent of the DTV service in Tolland, 90 percent of the DTV service in Windham and 60 percent of the DTV service in New London will receive interference from WJAR.

It is apparent from review of Figures 2 and 4 that the allotment of DTV channel 10 to WTNH results in a "shift" of interference from an area located entirely

outside WTNH's DMA to an area almost entirely within WTNH's DMA.

WBNE, New Haven, Connecticut

TV station WBNE currently operates on NTSC channel 59 with a nondirectional antenna maximum visual effective radiated power (ERP) of 5000 kilowatts (kW) and an antenna height above average terrain (HAAT) of 314 meters. In the DTV Docket, the Commission allotted DTV channel 6 to WBNE. The DTV transmitting facilities authorized are an ERP of 1.0 kW at an antenna HAAT of 314 meters. The FCC estimates that the DTV/NTSC area match will be 88.1%. As indicated below, the majority of interference to WBNE's DTV operation on channel 6 will be from the co-channel NTSC operations of WLNE-TV on channel 6 at New Bedford, Massachusetts and WRGB on channel 6 at Schenectady, New York, and will occur within WBNE's DMA where interference-free service currently exists.

Figure 5 depicts the service and interference for the current NTSC operation of WBNE on channel 59. The map shows the outline of the predicted Grade B contour, and the regions of calculated interference from other NTSC and DTV operations. The clear or unshaded area indicates where WBNE provides interference-free service. The Hartford-New Haven DMA boundaries have also been shown. The following stations are calculated to cause interference within the WBNE Grade B service area:

| Call/Location | NTSC/DTV Channel | Interference Area (sq. km) |
|---|---|---|
| WTIC-TV, New Haven, CT | NTSC-61 | 1,226 |
| WGBY-TV. Hartford, CT | NTSC-57 | 329 |
| WMUR-TV, Manchester, NH | DTV-59 | 504 |