



Appendix A: Broome County VHF High-Band Frequency Search

Public Safety Communications System Assessment and Design

Broome County, New York

Engineering Report

June 28, 2012



Table of Contents

1	Purpose and Scope	4
2	Finding Licensed Frequencies	5
3	FCC ULS Database Search Results	6
4	FCC Radius Review Results	7
5	ComStudy Frequency Finder Results.....	8
6	Interference Analysis Images	10
7	Conclusion	15



List of Figures

Figure 1: 153.8600 MHz Interference Analysis	10
Figure 2: 150.7750 MHz Interference Analysis	11
Figure 3: 154.4150 MHz Interference Analysis	12
Figure 4: 158.8950 MHz Interference Analysis	13
Figure 5: 158.9850 MHz Interference Analysis	14

List of Tables

Table 1: VHF Frequency Search Range	5
Table 2: Excel Spreadsheet Contents	6
Table 3: Frequency Information and Potential Analysis	8

Appendices

No table of contents entries found.



1 Purpose and Scope

The purpose of this document is to convey the results of following a process for finding VHF High-Band (HB) Public Safety (PS) frequencies licensed within Broome County, and frequencies that potentially may be licensable by Broome County on a countywide basis for conventional use. The potential for licensing frequencies will be based on a centrally located site and is not based on specific site locations or parameters.

The goal of the process is the following:

- Find Public Safety Pool Frequencies
 - Determine Frequency Ownership -
 - County
 - Local Government
 - State Government
- Find Potentially Licensable Frequencies
 - FCC Radius Review - Based on distance criterion, if frequencies found perform an engineering analysis.
 - ComStudy1 Frequency Finder - Use ComStudy's "Frequency Finder" function and determine the best candidate frequencies.

The scope is limited to searching the FCC's Universal Licensing System (ULS) database and employing ComStudy to find potentially countywide licensable frequencies.

1 A software radio propagation and FCC search tool from RadioSoft.



2 Finding Licensed Frequencies

To find frequencies licensed within the County and potential frequencies for licensing, the FCC's ULS database is searched. The search is performed and returns all PS licenses for the frequencies shown in Table 1. The search is performed for a sufficient distance (in this case 163 km) from the center of Broome County to include incumbent licenses that must be protected from potential interference from proposed Broome County radio operations.

Table 1: VHF Frequency Search Range

Frequency Range (MHz)
150.775 to 173.39625



3 FCC ULS Database Search Results

The results of the FCC ULS database search are contained in Excel spreadsheet titled, “110725_broome_150_775_to_173_39625_search_r001.” Given in Table 2 are the names of the Worksheets containing frequency information and a description of their contents.

Table 2: Excel Spreadsheet Contents

Worksheet	Contents
Site- Frequency Search Results	Not sorted FCC search results.
Sorted	FCC search results sorted by frequency.
Broome Co. Licensee	All frequencies licensed to Broome County.
Licenses in Broome County	All frequencies licensed within Broome County.
Sorted & Distance Filtered	Sorted by frequency and filtered by maximum search distance.
No Dup. Sorted & Filtered Dist.	Duplicate frequencies removed from “Sorted & Filtered Dist.” Worksheet.
No Dup. Sort.,Filt.,Min.Dist.	Same as above with minimum distance from search origin included
GIS, Broome Licensee	Information in a format for import into ArcMap

Worksheet “Licenses in Broome County” is a worksheet that can be given to the County for the determination of potential entities that may be willing to relinquish or share frequencies. Worksheet, “No Dup. Sorted & Filtered Dist” is used to create a separate Excel spreadsheet used in the FCC radius review process.



4 FCC Radius Review Results

From the Worksheet, "No Dup. Sorted & Filtered Dist" a separate Excel spreadsheet is created and imported into Mathcad2 to find unlicensed frequencies within the search distance of 163 km. The list of unlicensed frequencies is then checked against FCC Limitations and checked for nearest 7.5 kHz incumbents. If any frequencies are found that are free of incumbents for 80 km or more, the frequency is checked in ComStudy. Within ComStudy a search for co-channels (channels within 7.5 kHz are considered co-channels) incumbents are performed and R6602 contours created. Adjacent (15 kHz) wideband incumbents are not considered as interferers or protected from proposed interference due to the narrowbanding mandate. At this phase of the analysis what is considered is interference from co-channel incumbents to Broome (R6602 incumbent interference contours and mobile area of operations are plotted), and the likelihood of Broome operations to cause interference to co-channel incumbents.

The results of the process indicate that there are no potential frequencies.

2 Mathcad is a mathematical software programming tool from PTC.



5 ComStudy Frequency Finder Results

The results based on employing ComStudy’s “Frequency Finder” function are contained in Excel spreadsheet, “110725_broome_vhf_frequency_finder_r002.” The five best (considering ComStudy’s ranking, FCC Limitations, and Pool) frequencies have their own worksheet within the spreadsheet.

The list of frequencies is then checked against FCC Limitations and the frequency is checked in ComStudy. Within ComStudy a search for co-channels (channels within 7.5 kHz are considered co-channels) incumbents are performed. Adjacent (15 kHz) wideband incumbents are not considered as interferers or protected from proposed interference due to the narrowbanding mandate. At this phase of the analysis what is considered is interference from co-channel incumbents to Broome (R6602 incumbent interference contours and mobile area of operations are plotted), and the likelihood of Broome operations to cause interference to co-channel incumbents.

The results are shown in Table 3. The “Potential” Column indicates the potential for licensing the frequency.

Table 3: Frequency Information and Potential Analysis

Freq. (MHz)	Limitation1	Class of Station	Coord.2	Potential
153.8600	None	Mobile	PX	Possible interference to WQCI647 & WQJC294.
150.7750	87	Mobile	PM	Possible interference to Broome and WPNU736 and WPQB439 mobile operations.
154.4150	28	Base/Mobile	PF	Interference to Broome.
158.8950	None	Mobile	PX	Potential interference to WPPA233, WPNU736, & WPEZ832.
158.9850	None	Mobile	PH	Interference to Broome and WQHJ408, WPLX39, WQIW573, WQGX359, & WQLG624.

1: Limitations;

28: This frequency is not available for assignment in this service in Puerto Rico or the Virgin Islands.



87: The use of the frequencies 150.7750 MHz and 150.7900 MHz are limited a transmitter output power of 100 watts Effective Radiated Power (ERP) as of May 27, 2005.

2: Coordinator;

PF = Fire, PH = Highway Maintenance, PM = Emergency Medical, PX = Any Public Safety Coordinator, except the Special Emergency Coordinator.

The results of the analysis indicate that none of the frequencies are clear.

6 Interference Analysis Images

The interference analysis images for the frequencies given in Table 3 follow.

Red contours are incumbent R6602 interference contours, green contours are incumbent R6602 service contours, and green contours with black radial markings are incumbent's mobile area of operations.

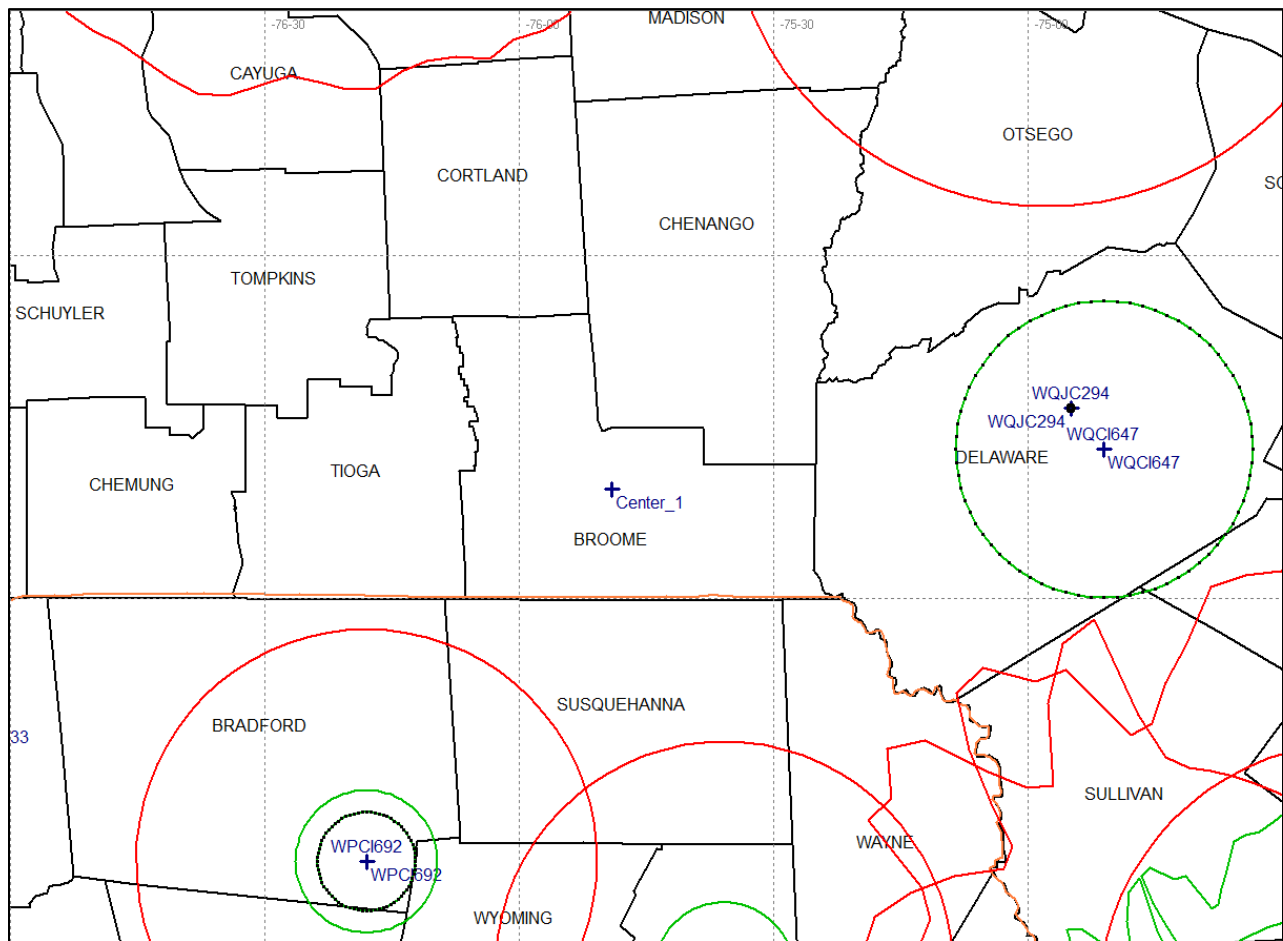


Figure 1: 153.8600 MHz Interference Analysis

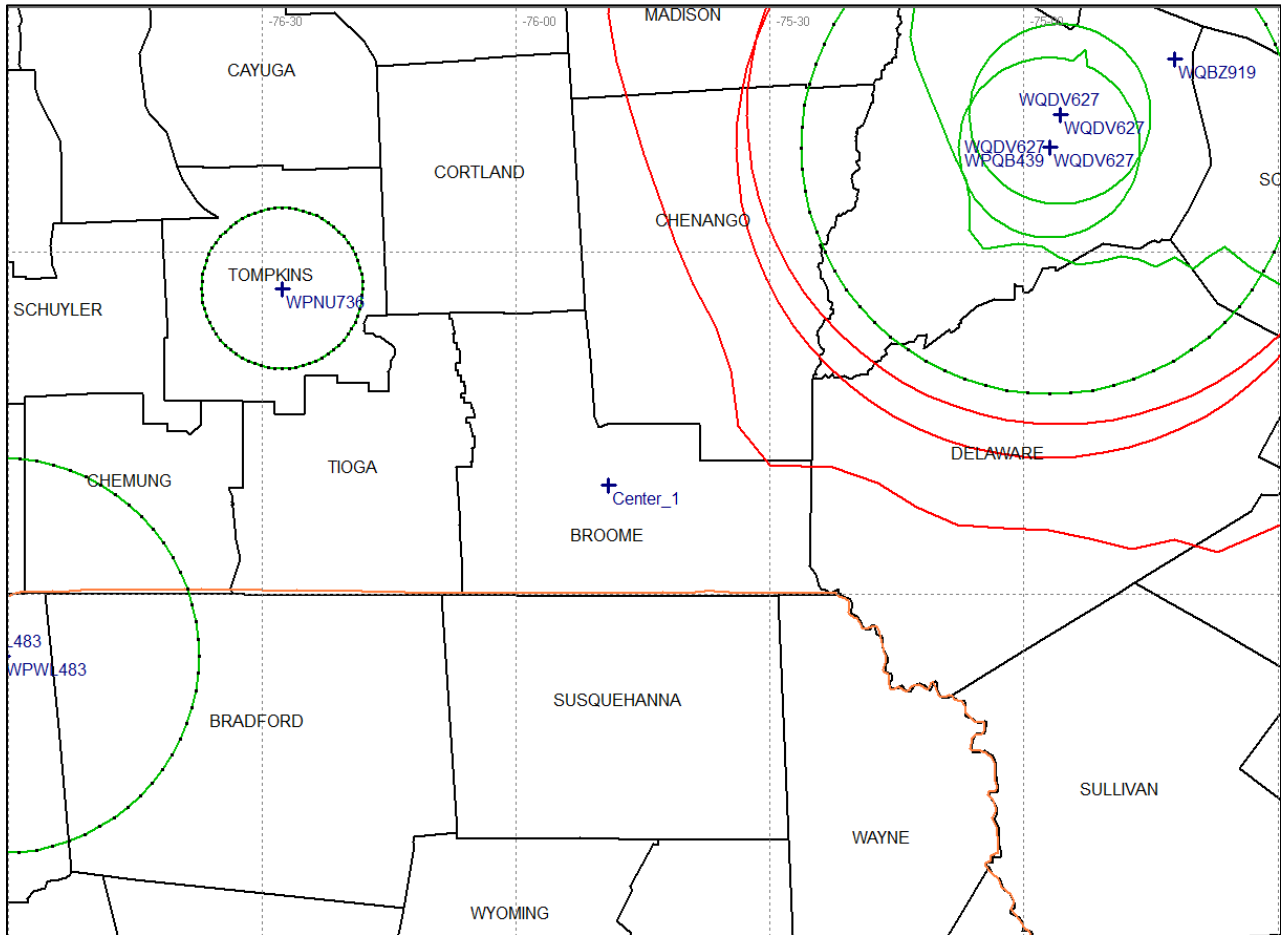


Figure 2: 150.7750 MHz Interference Analysis

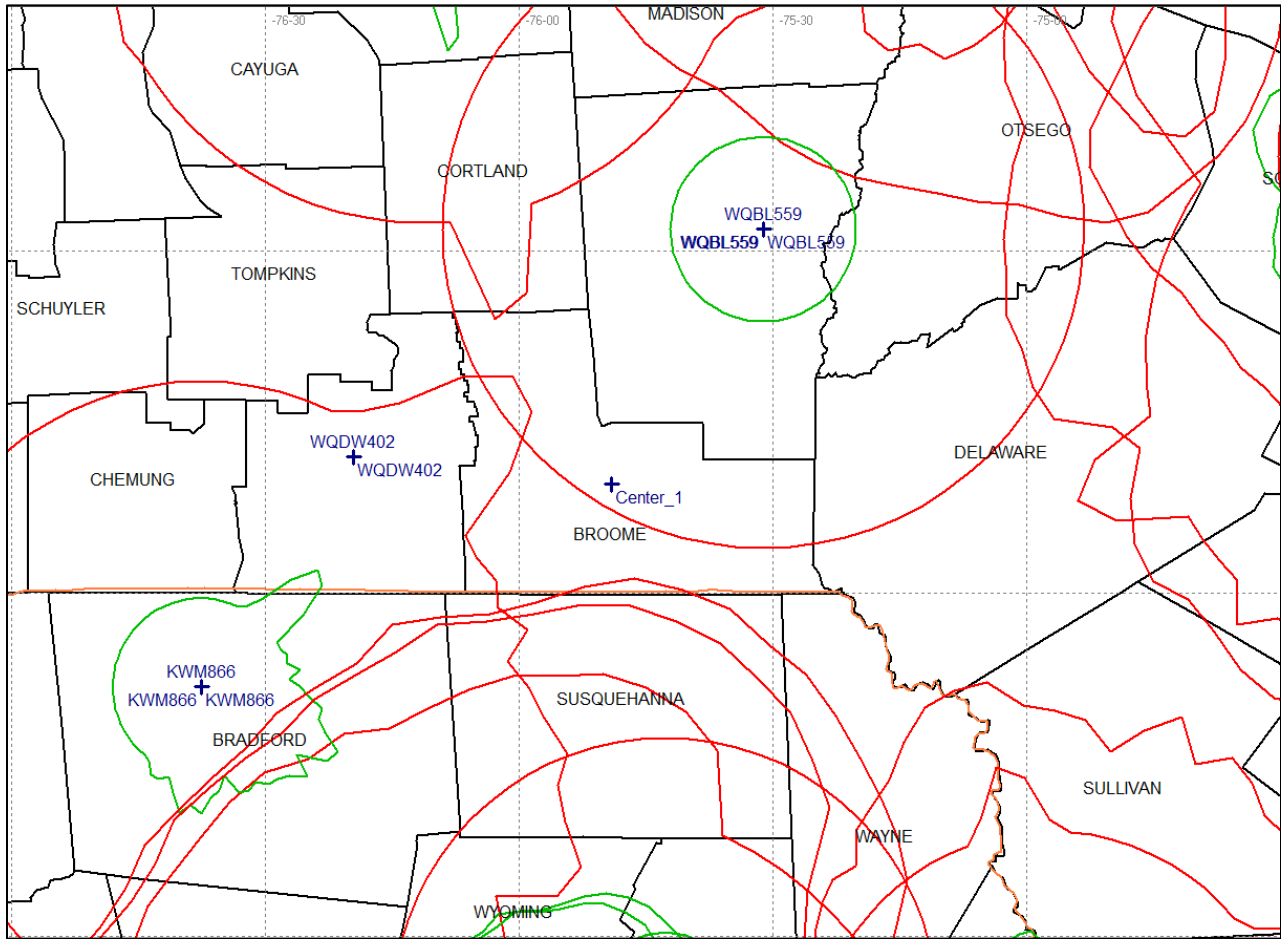


Figure 3: 154.4150 MHz Interference Analysis

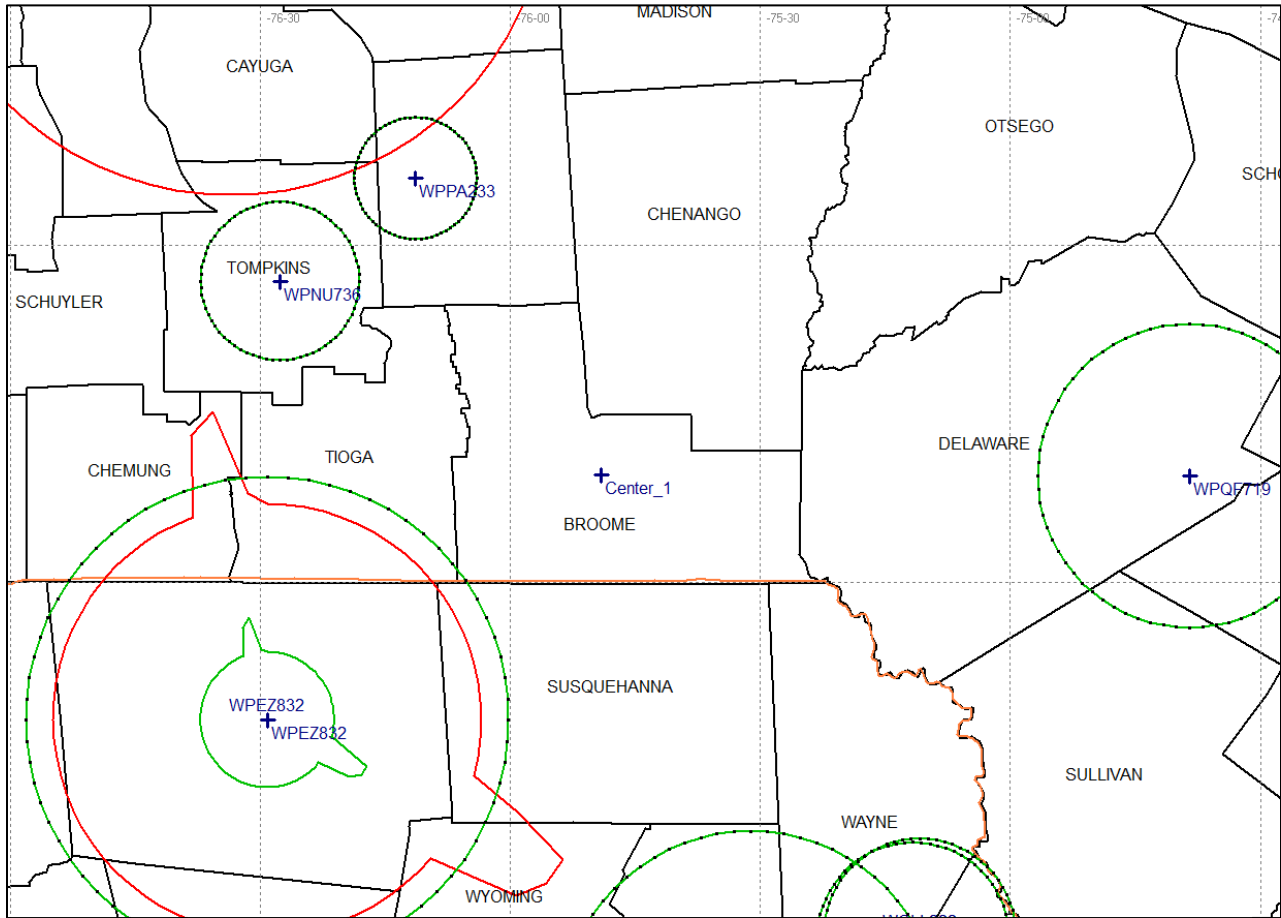


Figure 4: 158.8950 MHz Interference Analysis

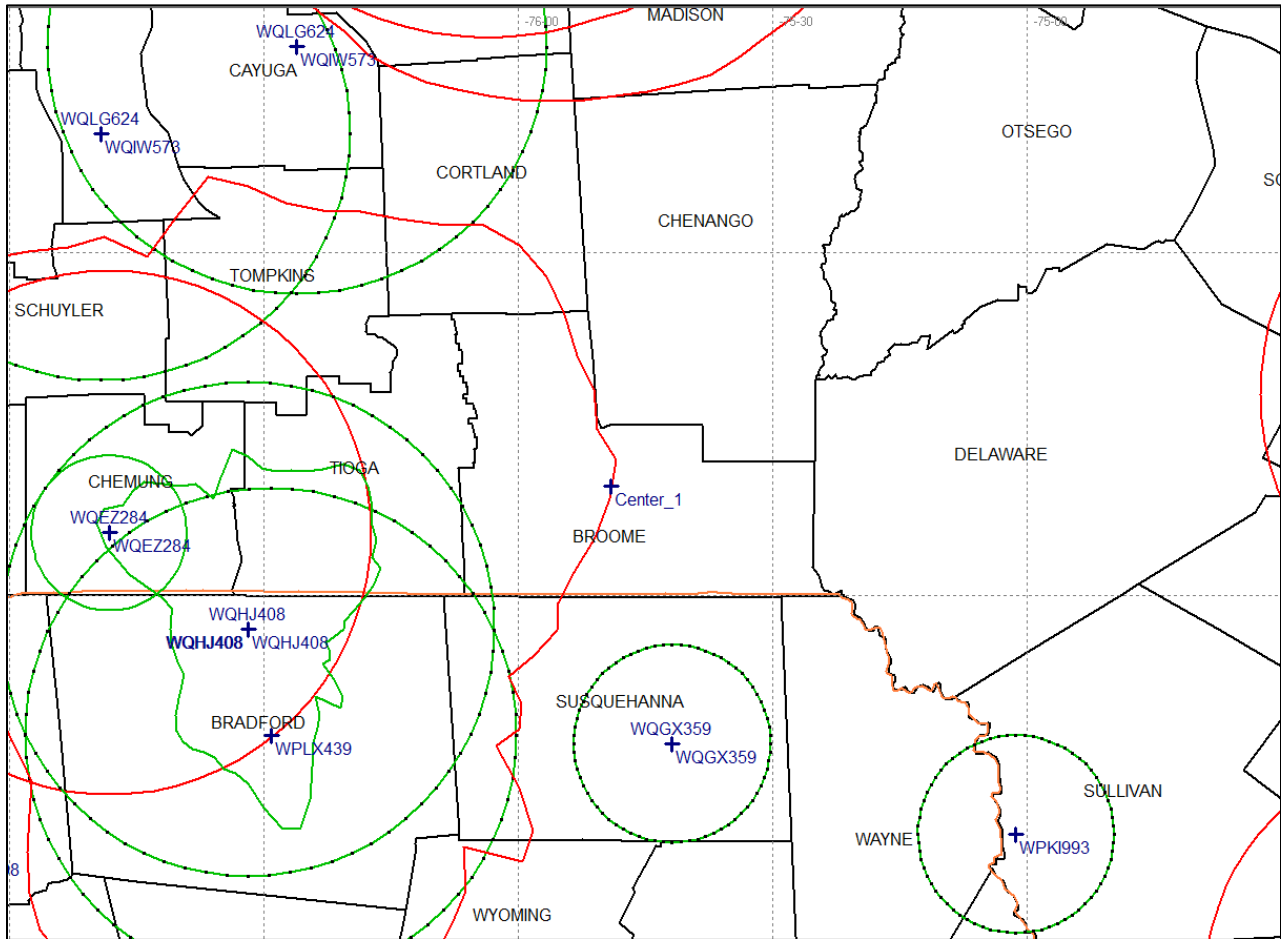


Figure 5: 158.9850 MHz Interference Analysis



7 Conclusion

The results of attempting to find countywide licensable frequencies utilizing two distinct methodologies and a fictitious centrally located site indicate none are available.

It is also highly unlikely that basing the analysis on specific sites and parameters would yield frequencies that are licensable countywide.