Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of:

Implementation of Sections 309(j) and 337 of	**)**	
The Communications Act of 1934 as Amended;	**)**	**WT Docket No. 99-87**
Promotion of Spectrum Efficient Technologies	**)**	
On Certain Part 90 Frequencies.	**)**	

REQUEST FOR TIME EXTENSION OF WAIVER OF COMMISSION RULES REGARDING THE SPECTRAL EFFICIENCY OF PRIVATE LAND MOBILE RADIO SERVICES IN THE 150-174 AND 450-470 MHZ BANDS, REQUIRING 12.5 KHZ CHANNEL BANDWIDTH OR EQUIVALENT TECHNOLOGY BY JANUARY 1, 2013

WAIVER—EXPEDITED ACTION REQUESTED

I. Introduction

The County of Augusta, Virginia ("County") respectfully requests a CONTINUED TIME EXTENSION of the waiver of the January 1, 2013 narrowband deadline presently expiring on January 1, 2016, for an additional period, until December 31, 2016.

Respectfully submitted, December 18, 2015

/s/ Patrick J. Coffield

County Administrator
County of Augusta
18 Government Center Lane, P.O. Box 590
Verona, Virginia 24482

II. Background

The County is situated with radio transmitting sites within the defined Quiet Zone (QZ)[1]. This presents an extremely challenging radio frequency environment for effective wireless communications. The County's communications system supports public safety activities for police, fire and emergency medical communications.

The County public safety radio system supporting first responders was operating successfully in a wide band (20 kHz occupied bandwidth) mode. The Commission compelled the County to relicense the existing public safety radio system in a narrowband (11.25 kHz occupied bandwidth) mode. The County did not initiate this relicensing on a voluntary basis, as no changes were proposed to the system other than adding mandated narrowband emission.

The situation of the County is unique in that reduction of occupied bandwidth from the previously authorized 20 kHz to the mandated 11.25 kHz caused the modified authorization to reflect a severe reduction in transmitted directional effective radiated power (dERP) toward the National Radio Astronomy Observatory (NRAO). In a vast majority of other narrowband conversions, outside of the Quiet Zone, there is a slight reduction in analog system coverage caused by the reduction in occupied bandwidth. Actually the spectral density of the transmitted signal increased by the compression of the bandwidth, but receiver acceptance and noise figure contribute to an overall system

[1] 47 CFR § 1.924(a)Quiet Zones - intended to minimize possible interference at the National Radio Astronomy Observatory site located at Green Bank, Pocahontas County, West Virginia, and at the Naval Radio Research Observatory site at Sugar Grove, Pendleton County, West Virginia.

coverage reduction. Most of the narrowbanded systems accepted this analog coverage reduction or converted to a digital modulation to recapture the lost coverage. These systems, outside of the Quite Zone, were able to simply modify the license to reduce bandwidth and retain existing technical parameters such as antenna type, antenna height, HAAT, and ERP.

Within the Quite Zone a different standard was applied to narrowband. The Commission required that licenses converted to narrowband be reviewed by the NRAO for impact to the radio astrometry receiving system. The NRAO took this opportunity to impose restrictions that reduced the ERP toward the receiving facilities.

A majority of Quite Zone licensees had licenses that were previously evaluated by the NRAO using prediction modeling software. These licensees were again reviewed in the narrowband licensing process using an enhanced version of the NRAO prediction modeling software and received modest dERP reduction based upon the enhanced software and the increased spectral density caused by narrowband emissions. Every existing Quiet Zone licensee received a modest dERP reduction from the wideband licensed dERP.

The County is unique in the Quiet Zone in that in 1998 the County objected to the NRAO propagation modeling software prediction and participated along with the NRAO in on-the-air testing of the transmitting sites to determine the impact, if any, to the receiving stations of the NRAO. This on-the-air testing produced no impact to the NARO receiving stations and resulted in a grant of much higher dERP than was predicted by the software. Thus the

County was permitted to operate a wideband radio system well in excess of the NRAO signal prediction software without causing any perceptible interference. As the County attempted to modify the wideband licenses to narrowband operation, the NRAO again applied the enhanced signal prediction software and was not willing to conduct on-the-air testing. This resulted in a dERP limit by the NRAO that not only was less than the original 1998 predicted permissible dERP, but was draconically less than the dERP determined acceptable in 1998 actual on-the-air testing.

The change in dERP at one site was reduced from 212 Watts dERP to 1.5 Watts dERP, with no physical change in the transmitter parameters other than a reduction in bandwidth and with no definite indication that the previous dERP was actually exceeding the NARO receiving stations threshold. This change in dERP forced the County to re-configure the system adding additional sites in order to recover lost coverage in the jurisdictional area required for public safety operations of the County. The lost coverage was not a result of narrowbanding the transmitted signal, but was a direct result of the NRAO vacating a previous dERP approval that was based upon actual field testing and substituting a significantly reduced dERP based upon less reliable propagation modeling. The loss of coverage was significant and would impact the safety of first responders and the citizens they serve. The additional infrastructure required site development, equipment purchase, and backhaul systems, all of which resulted from the Commission requirement that the County obtain a narrowband license.

The County seeks a continued time extension of the granted WAIVER for specific call signs (see Appendix A) for operations that will continue on lower spectrum bands and will be taken to compliance by the end of the extended WAIVER period. This list includes call signs and frequencies that are both directly and indirectly impacted by NRAO determinations. Appendix B lists the directly impacted licenses, showing the pre and post narrowband ERP limits.

III. Steps Taken by the County to Comply with the Narrowbanding Mandate

The County operations will continue on frequencies in the 450-470 MHz range. These systems will be taken into compliance with narrowband in the new projected time frame of December 31, 2016.

The County expected that conversion from wideband analog to narrowband analog would be a relatively inexpensive and speedy process. Sufficient funding was set aside to transition compatible hardware from wideband to narrowband through reprogramming of the transmitters and receivers. Funding was also anticipated and secured to replace subscriber units where the age of the unit did not allow for narrowband analog operation. Sufficient time was provided to allow for the reconfiguration of the County systems.

The first step in the process was to add narrowband analog emission to the County licenses. These licenses have been processed and approved by the Commission. The next step would have been to commence system conversion to meet the required cut-over time. Unfortunately this is where the process remains stalled. The County is required to develop

additional transmitter sites to compensate for the ERP reduction imposed by the NRAO. Additional sites are required at much lower ERP and antenna HAAT values. This additional number of sites, coupled with recent requirements for local zoning, environmental and historical impact considerations has caused the project to slip in time and become a very expensive process for the County, both in tax dollars spent and staff time to manage the transition.

IV. Specificity of Transition Delay beyond the existing WAIVER

The County implemented a process of defining the location of additional transmitters to provide coverage to the areas lost to the NRAO restrictions. This was a complicated process that involved the following considerations:

1. **Identifying possible transmitter sites.**

   During the WAIVER time period the County developed and issued an RFP for a commercial tower company to construct a new tower on one of several locations that was identified as a result of comprehensive coverage prediction and field path microwave analysis processes in Deerfield Valley. As a result of the procurement process the County executed a contract to build a new 300' tower in Deerfield Valley. The County has completed construction of a new tower site to support the LMR system. Placing the site on air is being delayed by completion of the microwave path (facing Elliot's Knob), which provides the infrastructure interface of the site with the core simulcast system.

All land mobile transmitter equipment and antennas have been purchased and installed at the new Deerfield Valley site. The County issued a purchase order to Motorola/Ceragon for microwave equipment. Once the microwave radio equipment and antennas are installed the Deerfield Valley site, it can function as a simulcast site in the County system and fill one of the coverage voids that will be created once the transmit antenna is replaced on Elliot's Knob to comply with the NRAO special conditions imposed on the County's operating parameters for this site. A delay in interconnection has occurred at the Elliot's Knob end of the path where the Virginia State Police (VSP) must implement structural upgrades to support the County's microwave antenna. Once VSP completes the upgrades, and authorizes the County to install the antenna, we can likely have it completed within one to two months, depending on weather and availability of tower and microwave contractors.

A second additional new RF site at Troxell Gap was needed to mitigate the coverage loss imposed by the NRAO, which will fill an RF coverage gap in the Craigsville, VA area. This is a second gap identified that would otherwise be lost with the redesign of the narrowband system. The County expects to have the site completed by late July 2016. The County is working with the radio vendor to provide the necessary base stations and infrastructure necessary to support the Troxell Gap site Although the site appears to be a good viable option, additional work is required to finalize the location including obtaining an FCC Structure Registration (ASR).

Augusta County is required to replace the existing antennas at Devil's Knob with special design directional antennas that would meet the NRAO dERP restrictions. The Devil's Knob tower (74' Monopole) does not have the structural capacity to support the directional antennas that would be required to meet NRAO dERP requirements. Augusta County has identified a new tower site, and is executing a lease agreement to install the directional antennas. The County is also contracting to Motorola to provide a new shelter, generator, microwave infrastructure, and LMR equipment for the new site. The new site will be ready for cutover in Dec 2016.

2. **Requesting NRAO review of the candidate sites.**

   All NRAO reviews and licensing for LMR and Microwave operation have been completed and obtained for the Deerfield Valley site. The new construction at Troxell Gap will need final NRAO approval prior to the licensing process.

3. **Apply for FCC Antenna Registration for new or modified construction**

   This has been performed for the new Deerfield Valley tower. The new construction at Troxell Gap will need ASR approval prior to the licensing process.

4. **Comply with the new FCC antenna registration regulations for Environmental Compliance, including 30 day public notice.**

   This has been completed for the new Deerfield Valley tower. The new construction at Troxell Gap will need approval prior to the licensing process.

5. **Address public concerns and wait for the FCC to rule on the site approval.**

   This has been completed for the new Deerfield Valley tower site licensing issued. The new construction at Troxell Gap will need approval prior to the licensing process.

6. **Construct or modify the antenna structure**

   This has been performed for the new Deerfield Valley tower. The schedule for completing Troxell Gap is July 2016.

7. **Determine backhaul requirements.**

   The County now requires an enhanced backhaul system to support the additional transmitter sites required by the narrowband conversion and the NRAO restrictions. The existing backhaul was not sufficient to support the greater number of transmitter sites. It is anticipated that the County will acquire and install new microwave equipment through use of cooperative procurement via an existing contract between another Virginia political subdivision and Motorola/Ceragon. The County has utilized this procurement process to have field path surveys performed by Ceragon to evaluate these paths as well as a number of path options associated with this project.

   Analysis has been completed for the new Deerfield Valley tower, but final path evaluations are still underway for other tower sites as referenced above. Once the additional path evaluations are complete remaining backhaul requirements can be

finalized. The County has ordered and received new microwave equipment to complete the path to Deerfield. As previously stated, the MW path will be implemented upon authorization by the Virginia State Police to install the MW antenna on their tower.

8. **Purchase and install transmitters.**

   This has been completed for the new Deerfield Valley tower site as well as all of the other existing County LMR sites to provide for compatibility of transmitter/base station equipment for simulcast operation. When the Troxell Gap site is added this same approach will be taken with transmitter/base station equipment installation.

VI. CONCLUSION

As shown above, the County has worked diligently and in good faith to meet the Commission's narrowbanding WAIVER, without risking the safety of the public or the safety and efficiency of the emergency responders. The exhaustive process of conforming to revised NRAO spectral density limits, while still maintaining current systems at the highest performance levels, has cause a significant delay in narrow banding.

For the reasons stated and in consideration of the public safety issues involved; and the impact that NRAO has had on County planning, the Commission is PETITIONED to grant a CONTINUED TIME EXTENSION to the waiver of NARROWBAND compliance to DECEMBER 31, 2016.

APPENDIX A

LIST OF FCC RADIO AUTHORIZATIONS GRANTED TO THE COUNTY OF AUGUSTA, VA FOR WHICH WAIVER OF THE JANUARY 1, 2013 NARROWBAND OPERATION DEADLINE IS REQUESTED

callsign	FRN	Freq	class	Serv
KDA670	0002036044	451.0250	FB2	PW
KDA670	0002036044	451.0750	FB2	PW
KDA670	0002036044	456.0250	MO	PW
KDA670	0002036044	456.0750	MO	PW
KNFY393	0002036044	460.4000	FB2	PW
KNFY393	0002036044	465.0750	MO	PW
KNFY393	0002036044	465.4000	MO	PW
WNMW815	0002036044	453.7500	FB2	PW
WNMW815	0002036044	453.9250	FB2	PW
WNMW815	0002036044	458.7500	MO	PW
WNMW815	0002036044	458.9250	MO	PW
WPHE291	0002036044	458.3000	MO	PW
WPHE291	0002036044	460.3000	FB2	PW
WPHE291	0002036044	465.3000	MO	PW
WPKQ976	0002036044	460.5500	FB2	PW
WPKQ976	0002036044	465.5500	MO	PW
WPPC506	0002036044	456.0250	FX	PW
WPPC506	0002036044	458.0750	FX	PW

WPPC506	0002036044	458.9250	FX	PW
WPPC506	0002036044	458.7500	FX	PW
WZM674	0002036044	462.9500	FB2	PW/PM
WZM674	0002036044	462.9750	FB2	PW/PM
WZM674	0002036044	463.0000	FB2	PW/PM
WZM674	0002036044	463.0250	FB2	PW/PM
WZM674	0002036044	463.0500	FB2	PW/PM
WZM674	0002036044	463.0750	FB2	PW/PM
WZM674	0002036044	463.1000	FB2	PW/PM
WZM674	0002036044	463.1250	FB2	PW/PM
WZM674	0002036044	463.1500	FB2	PW/PM
WZM674	0002036044	463.1750	FB2	PW/PM
WZM674	0002036044	467.9500	MO	PW/PM
WZM674	0002036044	467.9750	MO	PW/PM
WZM674	0002036044	468.0000	MO	PW/PM
WZM674	0002036044	468.0250	MO	PW/PM
WZM674	0002036044	468.0500	MO	PW/PM
WZM674	0002036044	468.0750	MO	PW/PM
WZM674	0002036044	468.1000	MO	PW/PM
WZM674	0002036044	468.1250	MO	PW/PM
WZM674	0002036044	468.1500	MO	PW/PM
WZM674	0002036044	468.1750	MO	PW/PM
WPLX499	0005517081	458.7500	FX	PW
WPLX500	0005517081	458.7500	FX	PW

WPLX501	0005517081	458.7500	FX	PW
WPLX523	0005517081	465.5500	FX	PW
WPLX524	0005517081	460.5500	FB	PW
WPLZ932	0005517081	460.5500	FB	PW
WPLZ935	0005517081	460.5500	FB	PW
WPLZ935	0005517081	465.5500	FX	PW
WPZR590	0007189301	451.2500	FBT	IG

APPENDIX B - LICENSES DIRECTLY IMPACTED BY NRAO ERP LIMITS SHOWING PRE AND POST NARROWBAND LIMITS.

Call Sign		Location	NRAO dERP Pre NB (W)	NRAO dERP Post NB (W)
WNMW815		1	212	1.5
WNMW815		3	25	1.4
WPHE291		1	212	1.5
WPHE291		3	25	1.4
WPKQ976		1	212	1.6
WPKQ976		3	25	1.4
KDA670		1	212	1.5
KDA670		3	25	1.4
KNFY393		1	212	1.5
KNFY393		3	128	1.4
WZM674		1	212	4.2
WZM674		3	25	25

APPENDIX C - PROJECTED TIME TO COMPLETION OF NARROWBAND

Task Name	Duration	Start	Finish
Augusta County Narrowband Project Schedule	**250 days**	**Tue 12/29/15**	**Mon 12/12/16**
Award Contract to Motorola	1 day	Tue 12/29/15	Tue 12/29/15
Contract Design Review	**48 days**	**Wed 12/30/15**	**Fri 3/4/16**
Order Processing, Equipment Manufacturing & Delivery	80 days	Mon 3/7/16	Fri 6/24/16
Civil and Site Work Development	**160 days**	**Wed 12/30/15**	**Tue 8/9/16**
Elliot's Knob	119 days	Wed 12/30/15	Mon 6/13/16
Massanutten	160 days	Wed 12/30/15	Tue 8/9/16
Devil's Knob	159 days	Wed 12/30/15	Mon 8/8/16
Troxell Gap	10 days	Tue 7/19/16	Mon 8/1/16
Verona	157 days	Wed 12/30/15	Thu 8/4/16
Equipment Installation and Optimization	35 days	Fri 9/30/16	Thu 11/17/16
Final Testing and Cutover	**17 days**	**Fri 11/18/16**	**Mon 12/12/16**
Troxell Gap Site Development	**136 days**	**Mon 1/11/16**	**Mon 7/18/16**
Contract Award	0 days	Mon 1/11/16	Mon 1/11/16
Environmental Regulatory / NEPA/ SHPO	80 days	Tue 1/12/16	Mon 5/2/16
Tower Site Design	21 days	Mon 1/25/16	Mon 2/22/16
Zoning and Permitting	51 days	Tue 2/23/16	Tue 5/3/16
Tower Design, Geotech/ Structural Design	16 days	Mon 4/18/16	Mon 5/9/16
Site Construction	26 days	Mon 6/13/16	Mon 7/18/16
Troxell Gap Complete	0 days	Mon 7/18/16	Mon 7/18/16