

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of	)	
	)	
CITY OF LEWISBURG	)	FCC File No. 0004650786
	)	WT Docket No. 11-56
Request for Waivers of Part 90 Rules to Permit	)	
Implementation of Wireless Water Management	)	
System	)	

ORDER

Adopted: July 28, 2011

Released: July 29, 2011

By the Deputy Chief, Mobility Division, Wireless Telecommunications Bureau:

1. *Introduction.* We have before us an application and waiver request filed by the City of Lewisburg, West Virginia (“Lewisburg”).¹ Lewisburg requests waivers of various Part 90 rules to allow implementation of a wireless water management system. For the reasons discussed herein, we grant Lewisburg’s waiver request.

2. *Background.* Lewisburg has approximately 3,500 residents, and is the seat of Greenbrier County, a rural county in southern West Virginia.² Lewisburg is located within the Quiet Zone for the National Radio Astronomy Observatory (NRAO) at Green Bank, West Virginia.³ Section 1.924(a) of the Commission’s Rules provides that an entity filing an application to operate a new or modified station in the NRAO Quiet Zone must notify NRAO, and provide technical details of its proposed operation.⁴

3. Lewisburg’s Department of Public Works provides potable water, storm water management services, and other services to the residents and businesses of Lewisburg and surrounding areas; and its Fire Department relies on water provided by the Department of Public Works in protecting safety of life and property.⁵ The Department of Public Works currently reads water meters manually, which allows even serious water leaks to go undetected for a month or longer.⁶ Pursuant to the American Recovery and Reinvestment Act of 2009 (ARRA), Lewisburg received a grant to purchase and install a radio-based

¹ See FCC File No. 0004650786 (filed March 14, 2011), Request for Waiver (“Waiver Request”). Lewisburg supplemented its waiver request on June 29, 2011. See Letter dated June 29, 2011 from Julian P. Gehman, counsel for Lewisburg, to Rick Kaplan, Chief, Wireless Telecommunications Bureau (“Supplement”).

² Waiver Request at 1. Greenbrier County has a population density of approximately thirty-five people per square mile. *Id.*; see also 47 C.F.R. § 27.14(o)(1)(iii) (defining “rural area” as “a county (or equivalent) with a population density of 100 persons per square mile or less”).

³ See 47 C.F.R. § 1.924(a)(1).

⁴ *Id.* Applicants may coordinate their proposed operations with NRAO before filing the application. If the application lacks NRAO’s prior written consent, NRAO may file comments or objections, which the Commission will consider when deciding how to resolve the application. See 47 C.F.R. § 1.924(a)(2), (3).

⁵ Waiver Request at 1.

⁶ *Id.*

meter-reading and control system.⁷ Lewisburg then solicited proposals for construction of a wireless water management system pursuant to the terms of the grant.

4. The only qualified proposal was for a system utilizing equipment manufactured by Sensus USA, Inc. (Sensus), and operating on 900 MHz band spectrum licensed to Sensus.⁸ NRAO, however, would not consent to operation in that band due to concerns about the power density.⁹ NRAO did consent to operation in the Federal 410-430 MHz band (where Sensus equipment used abroad operates), but Lewisburg could not obtain authorization to operate in that band.¹⁰ The National Telecommunications and Information Administration (NTIA) recommended that Lewisburg instead operate in the 450-470 MHz band (for which Sensus can modify its 410-430 MHz equipment).¹¹

5. In 2011, Lewisburg successfully coordinated with NRAO for operation in the 450-470 MHz band,¹² then filed the above-captioned application and associated waiver request.¹³ Lewisburg proposes to operate three fixed base stations, and up to five thousand remote units. Each base station would transmit and receive on a different pair of fifty-kilohertz frequencies.¹⁴

6. *Discussion.* To obtain a waiver of the Commission's Rules, a petitioner must demonstrate either that the underlying purpose of the rule(s) would not be served or would be frustrated by application to the present case and that grant of the waiver would be in the public interest; or that, in view of unique or unusual factual circumstances of the instant case, application of the rule(s) would be inequitable, unduly burdensome, or contrary to the public interest, or the applicant has no reasonable alternative.¹⁵ Lewisburg asserts that the underlying purposes of the rules at issue would not be frustrated because there are no nearby land mobile systems that will be impacted from operation of the system, and numerous other land mobile frequencies remain available for assignment in this rural area.¹⁶ In addition, Lewisburg argues that it has no other option for implementing a wireless water management system pursuant to the ARRA grant in the NRAO Quiet Zone, and the public interest benefits of proposed system weigh heavily

⁷ *Id.* at 2.

⁸ See Supplement at 1. Sensus manufactures the equipment, and its subsidiary Sensus Spectrum LLC holds the 900 MHz band licenses. Waiver Request at 2.

⁹ See Waiver Request at 2.

¹⁰ *Id.* at 2-3.

¹¹ *Id.* at 3.

¹² See Letter dated March 9, 2011 from Paulette W. Woody, Interference Office, NRAO to City of Lewisburg (attached to application FCC File No. 0004650786). NRAO consented to the proposed operations on the condition that the effective radiated power relative to a dipole antenna at location 2 (Frankford Tank) be limited to 12.2 watts per 14.75 kilohertz unit bandwidth at 41.1 degrees true azimuth bearing. See *id.* at 1-2.

¹³ The Wireless Telecommunications Bureau's Mobility Division sought comment on Lewisburg's waiver request. See Wireless Telecommunications Bureau Seeks Comment on City of Lewisburg, WV Request for Waivers of Part 90 Rules to Permit Implementation of Wireless Water Management System, *Public Notice*, WT Docket 11-56, 26 FCC Rcd 4096 (WTB MD 2011). No comments or reply comments were received.

¹⁴ Specifically, location 1 (Fairlea Tank) would transmit on frequency 461.5625-.6125 MHz, and the associated remote units would transmit on frequency 452.6125-.6625 MHz; location 2 (Frankford Tank) would transmit on frequency 462.4625-.5125 MHz, and the associated remote units would transmit on frequency 451.0375-.0875 MHz; and location 3 (Ruffner Tank) would transmit on frequency 463.7375-.7875 MHz, and the associated remote units would transmit on frequency 451.3625-.4125 MHz.

¹⁵ See 47 C.F.R. § 1.925(b)(3).

¹⁶ See Waiver Request at 7-9.

in favor of the requested waiver.¹⁷ We conclude that Lewisburg has demonstrated that grant of the requested waiver is warranted under the circumstances presented.

7. *Fixed operations in the 450-470 MHz band.* The 450-470 MHz band is designated primarily for land mobile operations, but Section 90.261 of the Commission's Rules permits fixed use on a secondary basis.¹⁸ It limits fixed systems to one frequency pair with five megahertz separation between paired transmit and receive frequencies, and prohibits omnidirectional antennas with a gain greater than unity.¹⁹ Lewisburg's proposed system requires more than one frequency pair, and the Sensus equipment does not operate with five megahertz spacing.²⁰ Lewisburg also proposes to deploy omnidirectional antennas with a gain of greater than unity to cover the intended service areas. In addition, three of the fifty-kilohertz channels requested by Lewisburg include frequencies that Section 90.261(f) excludes from use for full-power fixed operations, because they are designated for low power use or for other uses.²¹ Lewisburg also requests waiver to allow its operation of the water management system on a co-primary basis with other licensees in the 450-470 MHz band.²² It is concerned that if it were to operate on a secondary basis, it might have to shut its wireless water management system down in the event of interference to other licensees.²³ It also notes that the Sensus equipment is designed for an exclusive-use environment, and does not monitor prior to transmitting or promptly relinquish the channel.²⁴ Consequently, a waiver of the monitoring requirement in Section 90.403(e) of the Commission's Rules²⁵ also is required.

8. The purpose of Section 90.261 is to provide some needed spectrum for fixed operations while, at the same time, ensuring that the 450-470 MHz band is used primarily for mobile operations.²⁶ Similarly, specifying a uniform separation between base and mobile operations is intended, *inter alia*, to standardize the frequency bands on which base and mobile station operations will occur, which facilitates reuse of the spectrum by other licensees.²⁷ The antenna gain limit and monitoring requirement are intended to protect co-channel mobile radio operations from interference.²⁸ Finally, the purpose of the

¹⁷ See *id.* at 5.

¹⁸ See 47 C.F.R. § 90.261(a).

¹⁹ See 47 C.F.R. § 90.261(c). Unity gain is the ratio (usually expressed in decibels) of the power required at the input of a loss-free reference antenna to the power supplied to the input of the given antenna to produce, in a given direction, the same field strength or the same power density at the same distance.

²⁰ Lewisburg proposes to operate with separations of approximately nine megahertz at location 1, eleven megahertz at location 2, and twelve megahertz at location 3.

²¹ See 47 C.F.R. §§ 90.261(f), 90.267(a). Two frequencies requested by Lewisburg (452.6125 MHz and 452.61875 MHz) are on the list in Section 90.261(f) of frequencies that are excluded from use for full-power fixed operations. See 47 C.F.R. § 90.261(f).

²² See Waiver Request at 6-7. Lewisburg also requests a waiver of the power limit in Section 90.261(b), which limits fixed stations in the 450-470 MHz band outside of urban areas to seventy-five watts output power. See *id.* at 9. We note, however, that Lewisburg's proposed output power does not exceed this value, so no waiver of Section 90.261(b) is needed.

²³ See Waiver Request at 6-7.

²⁴ *Id.* at 6.

²⁵ 47 C.F.R. § 90.403(e).

²⁶ Amendment of Part 90 Concerning Secondary Fixed Operations in the 450-470 MHz Band, *Report and Order*, PR Docket No. 91-66, 7 FCC Rcd 3498, 3498 ¶ 2 (1992) (*Secondary Fixed Report and Order*).

²⁷ Motorola, Inc., *Order*, 25 FCC Rcd 15892, 15893 ¶ 5 (WTB MD 2010).

²⁸ *Secondary Fixed Report and Order*, 7 FCC Rcd at 3501 ¶ 17.

exclusion of certain frequencies in Section 90.261(f) from use for full-power fixed operations is to accommodate low power operations,²⁹ or to reserve those frequencies for other specialized uses.³⁰ Based on the record before us, we conclude that grant of Lewisburg's request would not frustrate these purposes, for it appears that no co-channel licensees would be at risk of interference, and sufficient spectrum in the 450-470 MHz band channel pairs – including those designated for low power use – would remain available for land mobile operations in the area.³¹ Nonetheless, Lewisburg will be required to cooperate with any affected present or future co-channel licensees to minimize and reduce interference.

9. In addition, we conclude that grant of the subject request is in the public interest. Granting the waiver requests will serve the public interest by allowing Lewisburg to implement a water management system that will be of use to the Public Works Department in providing potable water, storm water management and additional services to the residents of Lewisburg and nearby areas. Water services, including systems to handle sewage and wastewater, are primary components of the nation's critical infrastructure.³² The continued use of spectrum is essential to the current and future operations of these industries.³³ Without adequate radio spectrum, we are concerned that providers of energy, water and railroad services would be unable to address major service interruptions due to natural disaster, equipment malfunctions or in some cases, terrorist activities.³⁴ Thus, grant of Lewisburg's waiver request promotes the Commission's homeland security objectives.³⁵

10. *Bandwidth limits.* As noted above, Lewisburg proposes to operate its wireless water management system on three fifty-kilohertz frequency pairs.³⁶ Section 90.209(b) of the Commission's Rules provides, however, that new applications for the 421-512 MHz band generally will not be acceptable for filing if the applicant utilizes channels with a channel bandwidth exceeding 12.5 kilohertz, and that systems operating with a wider bandwidth must convert to a channel bandwidth of 12.5 kilohertz

²⁹ See Amendment of Part 90 of the Commission's Rules and Policies for Applications and Licensing of Low Power Operations in the Private Land Mobile Radio 450-470 MHz Band, *Report and Order*, WT Docket No. 01-146, 18 FCC Rcd 3948, 3952-53 ¶ 8 (2003).

³⁰ See Amendment of Part 90 Concerning Secondary Fixed Operations in the 450-470 MHz Band, *Notice of Proposed Rule Making*, PR Docket No. 91-66, 6 FCC Rcd 1800, 1802 n.22 (1991). Moreover, we note that the primary frequency coordinator for those frequencies consented to Lewisburg's proposed use. See Electronic mail dated Feb. 11, 2011 from Cindy Matzel, RS/AAA, to Joann Salley-Howell, Frequency Coordination Manager, UTC Spectrum Services (attached to application FCC File No. 0004650786).

³¹ See Milwaukee Metropolitan Sewerage District, *Order*, 19 FCC Rcd 2623, 2624-25 ¶ 6 (WTB PSCID 2004) (*MMSD*) (waiving Section 90.261(a) to afford primary status for a wireless water management system).

³² Wireless Telecommunications Bureau Seeks Comment on NTIA Report on Current and Future Spectrum Use by the Energy, Water, and Railroad Industries, *Public Notice*, 17 FCC Rcd 2458, 2459 (WTB PSPWD 2002).

³³ *Id.*

³⁴ *Id.*

³⁵ See *MMSD*, 19 FCC Rcd at 2626 ¶ 10.

³⁶ In order to create these fifty-kilohertz channels, Lewisburg has applied for overlapping assignments on the following contiguous frequencies: 451.03750, 451.04375, 451.05000, 451.05625, 451.06250, 451.06875, 451.07500, 451.08125, 451.08750, 451.36250, 451.36875, 451.37500, 451.38125, 451.38750, 351.39375, 451.40000, 451.40625, 451.41250, 452.61250, 452.61875, 452.62500, 452.63125, 452.63750, 452.64375, 452.65000, 452.65625, 452.66250, 461.56520, 461.56875, 461.57500, 461.58125, 461.58750, 461.59375, 461.60000, 461.60625, 461.61250, 462.46250, 462.46875, 462.47500, 462.48125, 462.48750, 462.49375, 462.50000, 462.50625, 462.51250, 463.73750, 463.74375, 463.75000, 463.75625, 463.76250, 463.76785, 463.7750, 463.78125, and 463.78750 MHz.

or less (or equivalent efficiency) by the end of 2012.³⁷

11. We concluded above that grant of the subject request is in the public interest. We also conclude that, in view of the unusual factual circumstances of the instant case, application of the bandwidth limit would be inequitable, unduly burdensome, or contrary to the public interest, or leave Lewisburg with no reasonable alternative. A number of circumstances have compelled Lewisburg to opt for 450-470 MHz equipment that requires channels wider than 12.5 kilohertz. But for its location in the NRAO Quiet Zone, Lewisburg's wireless water management system would operate in the 900 MHz band. Lewisburg's attempt to obtain authorization to operate in the Federal 410 MHz band was unsuccessful. It now seeks to operate in the 450-470 MHz band based on NTIA's direction, and because that is the only available non-Federal band in which Lewisburg's only qualified bidder's equipment can operate. Finally, the conditions of the ARRA grant do not afford Lewisburg an opportunity to search further for a different technical solution. Moreover, as discussed above, we do not believe that Lewisburg's proposed operations will have a negative impact on any co-channel or adjacent channel operations in this particular spectrum environment.

12. *Licensing and equipment certification.* Lewisburg intends to operate up to five thousand remote units, including meters at individual residences and businesses. It requests a waiver to permit the remote units to be licensed as mobile units, rather than having to license each remote unit at a specific location. Lewisburg argues that licensing the remote units individually would be overly burdensome to both it and the Commission, with no concomitant benefit.³⁸ We agree, and will permit the remote units to be licensed as mobile units,³⁹ on the condition that Lewisburg maintain a record of the location of each remote unit, and provide that information to the Commission upon request.⁴⁰

13. Sensus must obtain equipment authorization for the 450-470 MHz equipment to be deployed by Lewisburg. In that regard, for the reasons explained above, we waive Section 90.203(j) of the Commission's Rules, which limits the bandwidth of, and sets a minimum data rate for, new equipment approval applications for radios in the 421-512 MHz band.⁴¹ A copy of this *Order* shall be submitted with the equipment authorization application.

14. *Conclusion.* Based on the circumstances presented in the record, we conclude that Lewisburg has met the requirements for waiver of the Commission's Rules. Accordingly, we grant the request for waiver to permit use of 450-470 MHz band frequencies for fixed service operations on a co-primary basis for operation of a wireless water management system with the requested technical parameters.

15. Accordingly, IT IS ORDERED, pursuant to Section 4(i) of the Communications Act of 1934, as amended, 47 U.S.C. § 154(i), and Section 1.925 of the Commission's Rules, 47 C.F.R. § 1.925, that the

³⁷ See 47 C.F.R. § 90.209(b)(5) note 3, (6)(i). Lewisburg also requires a waiver of Section 90.35(c) of the Commission's Rules, which limits the authorized bandwidth on some of the requested frequencies to six or eleven kilohertz. See 47 C.F.R. § 90.35(c). In addition, it requests a waiver of the emission mask requirements in Section 90.210 of the Commission's Rules, 47 C.F.R. § 90.210, to permit it to meet the emission mask only at the edges of the newly formed fifty-kilohertz channels.

³⁸ See Waiver Request at 10.

³⁹ See Milwaukee Metropolitan Sewerage District, *Memorandum Opinion and Order*, 21 FCC Rcd 7217, 7221 ¶ 12 (WTB PSCID 2006).

⁴⁰ Cf. Amendment of Part 15 of the Commission's Rules to Establish Regulations for Tank Level Probing Radars in the Frequency Band 77-81 GHz, *Notice of Proposed Rule Making and Order*, ET Docket No. 10-23, 25 FCC Rcd 601, 615 ¶ 41 (2010).

⁴¹ See 47 C.F.R. § 90.203(j)(4)(iv), (5).

waiver request filed by Lewisburg, West Virginia, on March 14, 2011, with respect to FCC File Number 0004650786 IS GRANTED, and application FCC File No. 0004650786 SHALL BE PROCESSED in accordance with this *Order*, ON THE FOLLOWING CONDITIONS: (1) Lewisburg shall maintain a record of the location of each remote unit, and provide that information to the Commission upon request; (2) the authorization for location 2 (Frankford Tank) shall contain the following special condition: “Effective radiated power relative to a dipole antenna shall not exceed 12.2 watts per 14.75 kilohertz unit bandwidth at 41.1 degrees true azimuth bearing.”

16. This action is taken under delegated authority pursuant to Sections 0.131 and 0.331 of the Commission’s Rules, 47 C.F.R. §§ 0.131, 0.331.

FEDERAL COMMUNICATIONS COMMISSION

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