Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Higher Ground LLC	)	File No. SES-LIC-20150616-00357
	)	
Application for Blanket Earth Station License	)	Call Sign E150095
	)	

COMMENTS OF CENTURYLINK[1] IN OPPOSITION TO APPLICATION

Pursuant to 47 C.F.R. § 25.154(a), CenturyLink submits these comments to oppose Higher Ground LLC's application for a blanket license to operate up to 50,000 mobile earth terminals for C-band operations.[2] CenturyLink is very concerned that the planned use of frequencies in the 5925-6425 MHz band for mobile earth station transmission purposes will cause harmful interference to CenturyLink's fixed microwave facilities located throughout the nation that use frequencies in this band. As such, CenturyLink urges the Commission to deny the application.

CenturyLink has over 500 fixed microwave facilities located primarily in more rural areas throughout the United States that use frequencies in the 5925-6425 MHz band. In fact, the majority of our microwave facilities use frequencies in this band. CenturyLink uses these frequencies for dual transmission as important segments in the backbone of its national communications network. These facilities enable CenturyLink to provide communications services particularly in more rural areas of the country where traditional wireline facilities are exceedingly difficult or expensive to place. These microwave facilities support wireline voice

[1] This filing is made on behalf of CenturyLink, Inc. and its subsidiary entities that provide communication services using fixed microwave facilities.

[2] *See Public Notice, FCC, Satellite Communications Services re: Satellite Radio Applications Accepted For Filing,* Report No. SES-01771 (Aug. 5, 2015) (listing Higher Ground Application SES-LIC-20150616-00357 as acceptable for filing).

and broadband services to rural communities including critical access to emergency services. These facilities support E911 circuits that enable life-saving emergency communications. These facilities may also provide links that aid the Federal Aviation Administration (FAA) in airport operations. They may also serve as diverse circuits that can be critical to ensure communications are sustained if a primary circuit goes down. These facilities also enable CenturyLink to provide communications infrastructure to support wireless communication services in these areas by providing backhaul of wireless communications.[3]

If another device using frequencies within the 5925-6425 MHz band is positioned too close to one of our microwave facilities, it could cause interference with the communications being enabled by the facility. This could include interference that elevates total noise and interference power levels in radio receivers, which affects modulation and therefore affects capacity, performance, or availability of communications. This could also include interference that is so disruptive that it terminates communications through that facility and thus bring down communications on the network possibly even causing a major outage.[4] This is not just potential interference to a call or two, or a data transmission here or there. This is potential interference to links in a communications network where each link carries hundreds of communications. And, it is not just potential interference to one or two specific links in a particular location, but it is potential interference to each and every such link of the network throughout the country.

Additionally, if these mobile devices caused interference, the intermittent nature of such devices would make it extremely difficult to isolate, identify, or locate them. And, the mobile nature of these devices and the nearly random direction of transmission of their antennas would exacerbate the problem further. Even if an interfering device has the technical ability to be

[3] See generally, Declaration of Thomas Schwengler ¶¶ 2, 3, attached hereto (Declaration).

[4] Declaration ¶ 4.

remotely shut down, it is very likely that troubleshooting time will be long, devices may not be accurately identified, and outages may be significant.[5]

Not surprisingly, then, to protect against harmful interference with fixed microwave facilities, the Commission has designated use of the 5925-6425 MHz band to only fixed facilities and implemented specific frequency coordination procedures.[6] Prohibiting mobile services in this band has been an effective tool for protecting and preserving quality communications across these fixed service facilities. And, the Commission has been quite clear that poor quality communications which could cause rural businesses to lose customers, could cause families to be cut off from relatives, and could interrupt public safety communications are not acceptable.[7]

Nevertheless, Higher Ground, in light of the intended high mobility of its proposed earth stations and nationwide scope, seeks a waiver of several long-standing protections for fixed services that would otherwise preclude the success of its application. In order to grant Higher Ground's application, the Commission would need to waive several of its current rules including, among others: (1) its current frequency coordination procedures for this band; (2) Note 6 to 47 C.F.R. § 101.147(a), which as the Satellite Division has noted prohibits assignment of the 5925-6425 MHz band to mobile earth stations;[8] and (3) the current Table of Frequency Allocations which similarly reflects that no mobile services are authorized in this band in the United States. Waiver of these provisions to grant this application is not appropriate. It is worth noting that of the forty-six bands set out in Commission Rule 101.147(a) as frequencies available for

[5] Declaration ¶ 5.

[6] *See Table of Frequency Allocations*, 47 C.F.R. § 2.106; 47 C.F.R. § 101.103.

[7] *See, e.g., In the Matter of Rural Call Completion*, WC Docket No. 13-39, Report and Order and Further Notice of Proposed Rulemaking, 28 FCC Rcd 16154 ¶1 (Nov. 8, 2013).

[8] *See* Letter from Paul E. Blais, Chief of the FCC International Bureau Satellite Division, to Adam Krinsky, Wilkinson Barker, Knauer, LLC, legal counsel to Higher Ground dated July 27, 2015, DA 15-864.

assignment for fixed microwave services, it is only one band, specifically 5925 – 6425 MHz, that the rule expressly notes is not available for assignment to mobile earth stations.[9] If the Commission wishes to revisit the reasoning for imposing this categorical exclusion of mobile earth stations from this frequency band it should do so through a formal rulemaking.

In seeking a waiver of the Commission's established frequency coordination procedures, Higher Ground offers its own procedure for protecting fixed microwave facilities from harmful interference.[10] Yet, by Higher Ground's own admission, it has yet to test its novel self-coordination regime for protecting fixed services from harmful interference.[11] To date, it has only performed testing where there were no operational fixed licensees close enough to create a potential interference situation.[12] It is thus far from certain that the alternative steps that Higher Ground is offering to protect against such interference will be sufficient to do so.

Higher Ground makes the claim that interference with fixed microwave links are not likely. But, the fact is that a mobile transmitter of 9dBW (39dBm) effective isotopic radiated power (EIRP) in the C-band will cause interference in some scenarios. And, the likelihood of that interference is debatable. Higher Ground's Technical Appendix derives a few guidelines to minimize interference by relying on some assumptions and estimates. But these estimates should be verified by a broader industry range of experts and tested. For instance, Higher Ground makes certain comparisons to maritime vessels and earth stations that are questionable

[9] 47 C.F.R. §101.147(a), Note 6.

[10] *See*, Higher Ground Application, Technical Appendix at A.8.

[11] *See* Letter from Adam D. Krinsky, Wilkinson Barker Knauer, legal counsel to Higher Ground to Paul E. Blais, Satellite Division, International Bureau, FCC dated July 30, 2015 at 2 (stating in response to Question 2 that "Higher Ground has a pending application to modify its experimental authorization . . . to allow SatPaq test operations using self-coordination.")

[12] *See* id (stating in response to Question 2 that to date Higher Ground has been testing only in Redwood City, CA on a frequency channel for which there are no operational fixed service licensees using that frequency channel within 125 miles).

because a Higher Ground mobile device with its power level behaves very differently (with nearly random direction of radiation) and has very different interference statistics than earth stations on ships. Furthermore, the combined level of many devices (potentially 50,000) raises questions of densities which may affect interference as well.[13]

Moreover, the simple fact is that even if Higher Ground's proposal is sufficient to protect against most harmful interference, that is not good enough. The facilities with which these mobile earth stations may interfere are critical to maintaining essential communication services in these areas. Low-risk of harmful interference is not an acceptable standard here. To adequately protect these facilities the standard should be no-risk of harmful interference. This view is perfectly consistent with the fact that this band is currently not authorized for any mobile land transmissions in the United States.[14]

In sum, Higher Ground is seeking a waiver of the categorical exclusion of mobile earth stations from using frequencies in the 5925 -6425 MHz band and waiver of established frequency coordination procedures, both of which are intended to protect fixed microwave facilities from harmful interference. In return, Higher Ground offers an as yet untested alternative mechanism for protecting fixed microwave facilities from harmful interference and

[13] Declaration ¶ 6.

[14] *See Table of Frequency Allocations*, 47 C.F.R. § 2.106. As noted in footnote NG181 to the Table of Frequency Allocations, earth stations on vessels are considered an application of fixed satellite service (FSS) and can be authorized to communicate with space stations of the FSS in the 5925 – 6425 MHz band. When the Commission modified its rules to permit ESV operation in this band, the Commission put extensive measures in place to protect fixed service facilities from potential interference from ESVs through a full rulemaking process. *See In the Matter of Procedures to Govern the Use of Satellite Earth Stations on Board Vessels in the 5925-6425 MHz/3700-4200 MHz Bands and 14.0-14.5 GHz/11.7-12.2 GHz Bands*, IB Docket No. 02-10, Report and Order, 20 FCC Rcd 674 ¶¶ 12-54, 59-72 (Jan. 6, 2005). And, even if one views that in this modification as a practical matter the Commission has authorized certain limited use for mobile earth stations on water of frequencies in the 5925-6425 MHz band, as a legal matter the ruling leaves unchanged the general ban on mobile earth station use of the frequencies in this band. This includes leaving the ban as applied to mobile earth stations on land wholly in place.

requests a blanket license to launch its novel service and interference protection scheme throughout the country in a frequency band that is heavily used by fixed microwave facilities to provide critical communication services across the country. At this juncture, this seems to be a recipe for disaster. CenturyLink respectfully requests that the Commission deny this application.

Respectfully submitted,

CENTURYLINK

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September 10, 2015

Before the
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Washington, DC 20554

In the Matter of	)	
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Higher Ground LLC	)	File No. SES-LIC-20150616-00357
Application for Blanket Earth Station	)	Call Sign E150095
License	)	

DECLARATION OF THOMAS SCHWENGLER

1. My name is Thomas Schwengler. I am employed as a principal architect at CenturyLink. My business address is 700 W. Mineral Ave., Littleton, Colorado 80120. In my current position at CenturyLink, some of my responsibilities include wireless transport strategy and developments, which include architecting microwave links in the CenturyLink network. In this capacity I am familiar with CenturyLink's fixed microwave facilities.

2. CenturyLink has over 500 fixed microwave facilities located primarily in more rural areas throughout the United States that use frequencies in the 5925-6425 MHz band. The majority of CenturyLink's microwave facilities use frequencies in this band. CenturyLink uses these frequencies for dual transmission as important segments in the backbone of its local and national communications network.

3. These facilities enable CenturyLink to provide communications services particularly in more rural areas of the country where traditional wireline facilities are exceedingly difficult or expensive to place. These microwave facilities support wireline voice and broadband services to rural communities. These facilities support E911 circuits and Federal Aviation Administration (FAA) circuits. Some facilities support diverse circuits that can be critical to ensure communications are sustained if a primary circuit goes down. Some facilities also support backhaul of wireless communications.

4. If another device using frequencies within the 5925-6425 MHz band is positioned too close to one of CenturyLink's microwave facilities, it could cause interference with the communications being enabled by the facility. This could include interference that elevates total noise and interference power levels in radio receivers, which affects modulation and therefore affects capacity, performance, or availability of communications. This could also include interference that is so disruptive that it terminates communications through that facility and thus bring down communications on the network possibly even causing a major outage.

5. If these mobile devices caused interference, the intermittent nature of such devices would make it extremely difficult to isolate, identify, or locate them. The mobile nature of these devices and the nearly random direction of transmission of their antennas would exacerbate the problem further. Even if an interfering device has the technical ability to be remotely shut down, it is very likely that troubleshooting time will be long, require costly field work, devices may not be accurately identified, and outages may be significant.

6. A mobile transmitter of 9dBW (39dBm) effective isotopic radiated power (EIRP) in the C-band will cause interference in some scenarios; how likely these scenarios are is up for debate. Higher Ground's technical appendix derives a few guidelines to minimize interference by relying on some assumptions and estimates. But these estimates cannot be trusted, and need to be verified by a broader industry range of experts and probably tested. For instance, Higher Ground makes certain comparisons to maritime vessels and earth stations that are questionable: a mobile device with that power level behaves very differently (with nearly random direction of radiation) and has very different interference statistics. Furthermore, the combined level of many devices of their fleet of 50,000 leads to questions of densities which may affect interference as well.

I declare, under penalty of perjury, that the foregoing is true to the best of my knowledge, information, and belief.

Thomas Schwengler, Ph.D.

Executed on September 9, 2015

CERTIFICATE OF SERVICE

I, Marjorie Herlth, do hereby certify that I have caused the foregoing **COMMENTS OF CENTURYLINK IN OPPOSITION TO APPLICATION** to be:

1) Filed with the FCC via the International Bureau Electronic Filing System; and

2) With a copy served, via electronic mail and first-class U.S. Mail, postage pre-paid, on each of the parties as referenced on the attached service list.

/s/ Marjorie Herlth

September 10, 2015

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